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THE DIAGNOSTIC VALUE OF PREGNANDIOL EXCRETION IN PREGNANCY DISORDERS

BY

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The substance pregnandiol, which is very similar in chemical structure to progesterone, is found in the urine only when a corpus luteum or a placenta is actively functioning in the body. It is thus present only during the luteal phase of normal menstruation and during pregnancy, and very strong evidence has now been accumulated, notably by Venning and Browne (1937), that it is an excretion product of progesterone metabolism. The observations leading to this conclusion have been confirmed in the main by me (Cope, 1940b) and have been summarized briefly elsewhere (Cope, 1940a). Pregnandiol is excreted in the urine as a compound with glucuronic acid, and the resultant complex, sodium pregnandiol glucuronidate, can be relatively easily isolated and estimated by direct weighing, full details of the method having been published by Venning (1937, 1938).

The excretion of this complex might thus be expected to throw valuable light on disturbances of pregnancy, especially those associated directly or indirectly with abnormal hormonal metabolism. During the past two years we have carried out pregnandiol analyses on a variety of abnormal forms of pregnancy in order to determine so far as is possible the conditions in which such analyses provide useful clinical information. In this work we have been chiefly concerned not with the theoretical implications of the data collected but with the establishment of the place of pregnandiol analysis as a diagnostic aid. The conclusions here considered are based on the study of over 100 cases of pregnancy, of which some 75 were seriously abnormal. It is hoped that from such a relatively small series of cases the significance of pregnandiol analyses can be broadly outlined, though it is realized that far more data must be collected before their significance can be firmly established. If our own conclusions can stimulate others to collect such data they will have served their main purpose.

Normal Behaviour of Pregnandiol

Before abnormalities of pregnandiol excretion can be interpreted the normal behaviour of this substance must first be understood. The following are the main points essential to the interpretation of results.

Although pregnandiol is excreted, isolated, and weighed as a glucuronide complex, its excretion is always expressed in terms of milligrammes of actual pregnandiol, this being 320/536 of the weight of the complex. For clinical purposes it is the total daily excretion which is of importance, the actual concentration in the urine being of little significance. The total amount of pregnandiol excreted during the whole luteal phase of normal menstruation varies from 3 to 60 mg. Maximal excretion usually occurs five to seven days before the onset of bleeding, and may be from 1 to 6 mg. a day, the latter figure being exceeded only rarely. Pregnandiol disappears from the urine before bleeding starts, but if pregnancy occurs and the period is suppressed then excretion continues. During the first few weeks of pregnancy the daily excretion remains small, the output often not exceeding that excreted during the peak days of a menstrual cycle. Since pregnancy is the only condition so far known in which amenorrhoea is associated with the continued excretion of pregnandiol the fact has already been used in a method of diagnosing early pregnancy. As pregnancy proceeds the daily output of pregnandiol increases, to reach a maximum in the eighth and ninth months, but after delivery it falls to zero in a few days. The height to which pregnandiol excretion rises varies considerably in different pregnancies. The recorded figures of reliable observers vary from 30 to 120 mg. a day in the last six weeks of pregnancy. Venning (1938) gives a mean figure of 75 mg. a day, but our own series of normal pregnancies varied from 30 to 110 mg., with a mean of 55 mg. There is no evidence that the lower figures are necessarily associated with any abnormality of the pregnancy. In the chart is shown a typical excretion curve throughout a pregnancy in which collection of all twenty-four-hour urine specimens is known to have been practically complete. The range of variation of a series of normal cases is shown in the shaded area. With such a wide normal variation it is clear that no clinical significance can be attached to even relatively large deviations from the mean value, and consequently pregnandiol assays for clinical purposes do not require to be very accurate.

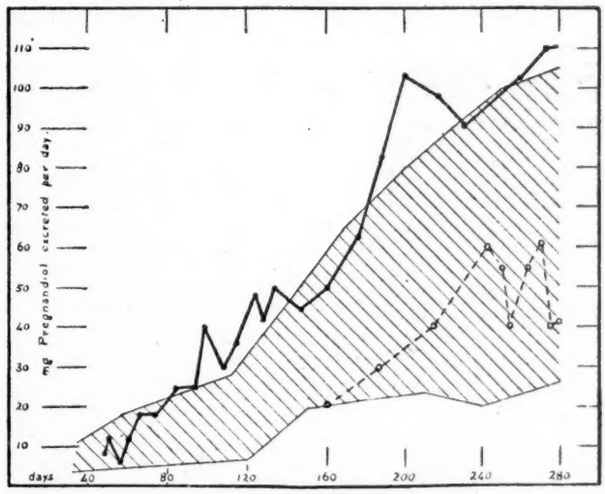

Chart showing pregnandiol excretion throughout normal pregnancy. Shaded area = range of variation of combined figures of Venning (1938) and Wilson and Randall (1938). Upper heavy curve = our own normal case. Lower interrupted curve = case from Hain (1940).

Estimation of Pregnandiol Excretion

Since the significant figure is not the concentration of pregnandiol but the excretion in twenty-four hours, it is necessary to make a complete twenty-four-hour collection of urine, of which the whole or a part is analysed. It is very desirable to have a check on the completeness of collection of urine specimens, and for this purpose we have used the excretion of creatinine. Estimation of the total creatinine content of the specimen is easy, and this will usually exceed 1,000 mg. a day. If the creatinine content of the supposed twenty-four-hour specimen is below this it may be incomplete, and if below 800 mg. should be considered almost certainly so. In such circumstances an approximate figure for pregnandiol excretion can be obtained by correcting the observed excretion to correspond to a creatinine excretion of 1,000 mg. a day.

Full details of the method of estimation of pregnandiol have been published by Venning (1937; 1938), to whose papers those interested are referred. It consists essentially in extracting the urine several times with butyl alcohol, distilling off this alcohol, and dissolving the residue in N/10 soda. This solution is again extracted with butyl alcohol, which is distilled off. The residue from this second distillation is dissolved in a small volume of water and the pregnandiol glucuronide precipitated by addition of excess of acetone. This precipitate is again dissolved in a small quantity of water and re-precipitated by acetone, the product thus purified being finally dried and weighed. In our hands this method has proved far superior both in convenience and in accuracy to any other which we have tried, and has therefore been used exclusively in this work.

The quantity of urine to be analysed must depend on its pregnandiol content. Generally 1,000 c.cm. or the day's output, whichever is less, is desirable before the twentieth week, and 500 c.cm. in the second half of pregnancy. It is wise to practise the method first with late pregnancy urine containing much pregnandiol, and later with a similar urine diluted with a pregnandiol-free urine so that familiarity with the white crystalline or flocculent precipitate may be gained. Blood or albumin in the urine makes the analysis more difficult—the former by yielding a dark greenish pigment in the final stages which may obscure the presence of small quantities of pregnandiol, the latter by favouring the development of emulsions during the butyl alcohol extraction that are difficult to break up. Such urines are best avoided until experience has been gained with the method on uncontaminated specimens. We have found it advantageous to saturate the urine with salt before extracting with butyl alcohol. This alcohol, which is distilled off during the analysis, may be used again for subsequent extractions without further purification, thereby effecting a great economy of material when many analyses are being made. All acetone used for precipitation of pregnandiol may also be dried with calcium chloride, distilled, and used again. In the method as developed by Venning the extracted pregnandiol glucuronide is re-precipitated from aqueous solution by acetone in order to ensure reasonable purity of the final product. We have carried out this second precipitation in every case and consider it highly desirable if fallacious results are to be avoided. Small quantities of impurity which may be mistaken for pregnandiol are often brought down in the first precipitation. They usually fail to appear in the second precipitation, but in doubtful cases a melting-point determination will decide. This should exceed 245° C. in ordinary urines, but in heavy albuminuria the final product is frequently less pure and has a lower melting point. These precautions are, however, usually only necessary when the amount of pregnandiol is small. When it is large the bulk of the first precipitate is sufficient evidence of adequate pregnandiol excretion, and then a second precipitation is not essential for many clinical purposes.

Pregnandiol Excretion in Pregnancy

In the first few months of pregnancy estimation of pregnandiol excretion can be of value in several ways.

1. Diagnosis of Pregnancy

Demonstration of pregnandiol in the urine in a case of amenorrhoea must be regarded as strongly suggestive of pregnancy, for no other condition is so far known in which the two are associated. It is necessary, however, before making this diagnosis, to be certain that the pregnandiol excretion is not the normal prelude to a fresh menstrual bleeding. To be of value estimations must be capable of detecting as little as 3 mg. a day, and the whole twenty-four-hour output must therefore be extracted. Wilson and Randall (1939) and Hain and Robertson (1939) have both used the test successfully for pregnancy diagnosis, but sufficient data are not yet available to determine how it compares in reliability with the Aschheim-Zondek reaction. Absence of pregnandiol from the urine of a woman with recent amenorrhoea usually means that she is not pregnant. We record two cases in which this was of diagnostic value.

Case 13.—A woman aged 39 became pregnant for the first time in February, 1939, but had an incomplete abortion in May requiring evacuation of the uterus. Menses occurred in June and July, but she returned in November, 1939, with a history of four months' amenorrhoea. She was believed to be pregnant again, and was entered as an ante-natal patient. The urine, examined because of her history of previous abortion, contained no pregnandiol, and it seemed probable either that she was not pregnant or that the foetus had died. This view was not accepted by the ante-natal department, but as the urine sixteen days later still contained no pregnandiol an Aschheim-Zondek test was ordered; this was negative. On admission to hospital no signs of pregnancy were found, and a diagnosis of pseudocyesis was made. The uterus contained a moderate-sized fibroid.

Case 78.—A woman aged 35 was admitted with a history of three months' irregular uterine bleeding with occasional brown discharge. The uterus was palpable above the pubes and was irregular. Fibroids were diagnosed, but there was a possibility of associated pregnancy. The urine was therefore examined for pregnandiol, but contained none on two occasions. At operation the absence of pregnancy was confirmed.

We have stated that absence of pregnandiol from the urine *usually* means that the patient is not pregnant. The qualification is necessary because cases do occur in which for a short time pregnandiol is absent. We believe they are uncommon, but their frequency can only be determined by study of a larger series of pregnancies. Our experience suggests that chronic nephritis can prevent the excretion of the pregnandiol complex, but it may also be absent when no renal lesion can be demonstrated. Browne, Henry, and Venning (1939) have noticed its absence for short periods in early pregnancy, and we have recently seen a woman in whom it was absent at the nineteenth and twenty-first weeks. After a threatened abortion at this time pregnancy proceeded normally, pregnandiol excretion at the twenty-fifth week being within normal limits (47 mg. a day).

This latter case (No. 34), the only one of its type we have encountered, has necessitated our advising a rather greater caution in interpreting the absence of pregnandiol than we had hoped would be necessary. It emphasizes the fact that results must be interpreted in close association with the clinical findings, but this is true of

many diagnostic tests which are nevertheless of great value when properly applied. Absence of pregnandiol should never be regarded as significant unless it is demonstrated on two or more occasions.

2. Threatened Abortion

Absence of pregnandiol from the urine of a woman with signs or symptoms of threatened abortion is evidence of abnormality and is an indication for repetition of the determination on one or more subsequent occasions. While its absence from a single collection of urine is usually significant some cases do occur in which this absence is of only short duration and does not seem to be of serious import. Browne, Henry, and Venning (1939) record one such case in which disappearance of pregnandiol from the urine on the forty-ninth day was followed by a continuation of normal pregnancy to full term and a rapid return of normal pregnandiol excretion; and our own case (No. 34), mentioned above, is another example. Care must therefore be taken in drawing conclusions from the result of a single analysis. If, however, pregnandiol is persistently absent at two or more determinations this is very suggestive of one of three possibilities: either abortion is inevitable, or the products of conception have been already partially or completely evacuated, or, finally, the foetus has died without expulsion, producing a condition of "missed abortion." Distinction between these three possibilities must be made by clinical means. The value of the pregnandiol estimation in threatened abortion lies not so much in aiding the diagnosis as in calling attention to the fact that serious abnormality is present, requiring closer investigation. The subsidence of acute symptoms is too often regarded as evidence that the threat of abortion has passed; but this is not always justified, and such cases may return weeks later with signs of retained products or of intra-uterine death. A negative pregnandiol assay in the urine will frequently enable an earlier diagnosis to be made at the time of acute symptoms. Treatment of a case of threatened abortion with no pregnandiol excretion should not be regarded as complete until either it is certain that the uterine contents have been evacuated or definite clinical evidence is obtained that the foetus is alive, the latter alternative occurring much less often. The following two cases illustrate the prognostic value of pregnandiol assays.

Case 25.—A woman aged 37, with two healthy children aged 14 and 12 years, was admitted with a history of twenty weeks' amenorrhoea and intermittent, irregular vaginal bleeding during the past three months. Previous menstrual history was normal and there had been no miscarriages. The uterus was the size of an eighteen weeks' gestation, the cervix was soft and closed, and there was blueing of the vagina. The foetal heart was not heard. With rest and sedatives symptoms subsided, but pregnandiol was absent from the urine on the three occasions when it was sought. In spite of this evidence of persisting abnormality she was sent home and wheat-germ oil was prescribed. A month later she had to be readmitted because of recurrence of bleeding. The uterus was now the size of ten to twelve weeks' pregnancy, and a large clot was passed. Evacuation of the uterine contents removed clot and small pieces of placental tissue. No foetus was found.

Case 9.—A woman aged 24, with one child, was admitted with a history of three months' amenorrhoea and slight vaginal bleeding at intervals during the past two weeks. There was abdominal pain "like that of menstruation." She had had a similar slight bleeding at the third month of her previous pregnancy, which had nevertheless gone to full term. The uterus was enlarged to the size of ten to twelve weeks' pregnancy; the cervix was completely closed, but there was an erosion round the external os which bled readily on swabbing. After a fortnight of treatment with rest and sedatives and a single injection of 5 mg. of progesterone her symptoms subsided, but a slight brown discharge began. Pregnandiol was absent from the urine on the five occasions during this time when it was sought, and thus made extremely probable a diagnosis of uterine death. An Aschheim-Zondek test was reported "negative, but hormone concentration is higher than in a non-pregnant woman." She was nevertheless sent home, but had to be readmitted one month later because of persistence of brown discharge. After rupture of the membranes a placenta of four months' development was removed. No foetal elements were seen.

In both these instances pregnandiol analyses gave very strong support to diagnoses which from the available clinical evidence could only be tentative. We have come to believe that persistent absence of pregnandiol excretion in a case of threatened abortion should be regarded as evidence suggesting that abortion is inevitable even if the classical signs of inevitability are lacking, for such signs are no more than indications that expulsion of uterine contents has already begun. But if pregnandiol is present in the urine in threatened abortion it is unjustifiable to conclude that abortion will not occur. Our series contains three cases which aborted in spite of high pregnandiol excretion figures, and Browne, Henry, and Venning (1939) report a similar case. We believe that this will prove to be not uncommon. If pregnandiol is present in the urine even in amounts as low as 3 mg. a day conclusions as to prognosis cannot safely be drawn. It is important, therefore, to distinguish between a small excretion and its complete absence, and for this reason the quantity of urine analysed should be the full twenty-four-hour output if possible.

3. Incomplete Abortion

Since pregnandiol is believed to be derived from the placenta rather than from the foetus its excretion might be expected to continue when fragments of placental tissue have been retained. We have studied six cases of incomplete abortion with symptoms sufficient to require admission to hospital; we found no pregnandiol in five, the sixth showing a doubtful trace. It seems, therefore, that the retained fragments are usually either too small or too damaged to provide pregnandiol in recognizable amount. This will presumably be influenced by the time that has elapsed since abortion took place.

4. Death of Foetus

When intra-uterine death is suspected on clinical grounds absence of pregnandiol from the urine provides strong support for the diagnosis, and we have found this to be the condition in which pregnandiol assays can be of greatest value. But here again the converse is not true, and a normal pregnandiol excretion is not evidence that the foetus is alive. If foetal death is suspected and pregnandiol is nevertheless found in the urine it is helpful to repeat the estimation at weekly intervals. A progressive fall in pregnandiol excretion is suggestive, though this may be difficult to demonstrate, since daily fluctuations are sometimes large. But if the excretion falls to zero the evidence is almost conclusive.

We have observed 20 cases at a time when there was clinical reason to believe that the foetus had died. In all these the death of the foetus was confirmed subsequently. Of these 20 cases, 6 had a complete absence of pregnandiol when first seen and thereafter, and in a further 3 it fell to zero while under observation. In 7 of the remaining cases pregnandiol excretion was definitely below normal limits, but not absent, and in the other 4 excretion could not be regarded as abnormal. Thus in 45% of these cases the absence of pregnandiol strengthened the diagnosis of foetal death. The low or normal excretion in the other 11 cases did not provide any diagnostic aid, since even when pregnandiol excretion

was low it was not considered justifiable to conclude that the foetus had died or was dying. Nor in any of these was clear evidence obtained of progressive fall in excretion, though more extensive observation would no doubt have revealed it in some. This, however, would have entailed a greater number of analyses than is likely to prove feasible for routine clinical purposes.

Our early experiences with the use of pregnandiol excretion in the diagnosis of intra-uterine death were so encouraging that we were able by this means to diagnose it correctly in two cases in which it had not been suspected. It was only later that the previously mentioned anomalous Case 34 was encountered and a greater caution in the interpretation of results had to be advised. It is clearly of great importance that the frequency of occurrence of such cases as this apparent exception should be determined on a large series. In another case we were encouraged, because of a rise in pregnandiol excretion, to cast doubt on a diagnosis of intra-uterine death although the radiologist had reported "definite evidence of death." In this instance a premature child was born alive, though it died soon after.

We believe that when further experience has been gained pregnandiol excretion will come to have a recognized place in the diagnosis of intra-uterine death, arousing the suspicion in some cases, strengthening it in others, and possibly even confirming it in some.

Interfering Factors

There is reason to hope that increasing understanding of the factors affecting pregnandiol excretion will enhance its diagnostic value. There is evidence that both chronic nephritis and toxaemia of pregnancy can seriously interfere with this excretion. We have seen one woman with renal functional impairment due to chronic nephritis who excreted no pregnandiol one day before delivery of a healthy living child at full term. In a second case of chronic nephritis pregnandiol excretion fell to zero at the twenty-seventh week and, in view of our experience of the previous case, we deemed it unwise to diagnose foetal death, though this had in fact occurred. Weil (1938) has reported that in toxaemia of pregnancy pregnandiol excretion may be absent, but I (Cope, 1940a) have been able to collect a consecutive series of 10 toxaemic cases showing no serious interference with pregnandiol output. Since this series was collected, however, we have seen a woman with pregnancy toxaemia without nitrogen retention in whom no pregnandiol excretion was present. Pregnandiol excretion will therefore probably prove unreliable as an aid to diagnosis in cases of pregnancy associated with either chronic nephritis or toxaemia of pregnancy.

Isolated observations on gravid women suffering from pyelitis, hypochromic anaemia, syphilis, hyperemesis, and severe diabetes have not revealed any interfering effect of these conditions on pregnandiol excretion.

Pregnandiol and the Aschheim-Zondek Test

Pregnandiol excretion provides information comparable to that of the Aschheim-Zondek and Friedman tests. This might have been expected, since both pregnandiol and the urinary gonadotrophin on which these tests depend are apparently derived mainly from the placenta. But measurement of pregnandiol excretion has several advantages over the biological tests. It does not require a licensed laboratory or facilities for housing animals, but can be done by persons unskilled in biological methods in any laboratory possessing a balance and means of centrifuging at low speeds quantities of fluid up to 500 c.cm. Being a gravimetric chemical analysis results are accurate, may be expressed numerically, and are not subject to the variations inherent in all biological reactions. Its main disadvantages are that it is rather more time-consuming than the biological tests and that it requires the collection of a larger quantity of urine, especially during the first few months of pregnancy. It is not strictly essential for clinical purposes, however, that the urine collection be a complete twenty-four-hour one provided the volume is adequate, for a simple creatinine estimation will indicate roughly but sufficiently what proportion of the day's urine output a given specimen represents.

Pregnandiol excretion enables pregnancy to be diagnosed as early as the Aschheim-Zondek test, though its reliability for this purpose has still to be investigated on a large series of cases. It is probably a less sensitive indicator of retained active placental fragments than the biological tests. In two of our cases of incomplete abortion the Aschheim-Zondek reaction was recorded as "negative but higher than non-pregnant," although no pregnandiol was detected in the urine. Unfortunately relatively few of the cases whose pregnandiol excretion we have studied have also had Aschheim-Zondek tests, but the detailed figures recorded by Browne, Henry, and Venning (1939) indicate that gonadotrophin excretion may continue at normal levels in cases of missed abortion in which pregnandiol has fallen to a low figure. This suggests that fall of pregnandiol excretion may prove a more reliable indicator of foetal death than the biological reactions based on gonadotrophin excretion.

We have seen two cases in which there was gross discrepancy between the pregnandiol excretion and the Aschheim-Zondek reaction.

Case 28.—A woman aged 29, with three children, was admitted with a history of two months' irregular uterine bleeding following an abortion. Incomplete abortion was diagnosed, curettage carried out, and scanty scrapings obtained. She returned home, but bleeding persisted and she was readmitted one month later. The uterus was larger than previously and vaginal blood clot contained a few hydatidiform villi. The urine contained no pregnandiol, but the Aschheim-Zondek test was positive in undiluted urine, negative in a dilution of 1 in 100. Evacuation of the uterus removed only small pieces of necrotic tissue. Bleeding continued and total hysterectomy was finally performed. The Aschheim-Zondek test one day before this operation gave a weak positive in 1 in 100 dilution. Diagnosis of chorion epithelioma was confirmed by the pathologist.

Case 33.—A woman aged 32 was admitted with a history of intermittent uterine bleeding. Diagnosis of threatened or incomplete abortion at nine weeks' pregnancy was made. The Aschheim-Zondek test was strongly positive, but the urine contained only a doubtful trace (0.7 mg.) of pregnandiol a day. The uterus was curetted, and early secretory endometrium but no placental tissue was obtained. She was discharged, but was readmitted two weeks later with symptoms of ectopic gestation. At laparotomy this was found to be ruptured but adherent to omentum. The Fallopian tube contained chorionic elements; the placental site and the decidual reaction were poor. The ovary contained a corpus luteum of pregnancy but was oedematous.

Although definite conclusions cannot be drawn from these two examples they are nevertheless of interest. In both of them incomplete abortion was originally diagnosed, the Aschheim-Zondek test was strongly positive and pregnandiol excretion absent, and uterine curettage at first revealed nothing significant. We had been led to hope by Case 28 that the association of a strongly positive Aschheim-Zondek test with absence of pregnandiol might prove of diagnostic value in chorion epithelioma; but Case 33, although giving a similar initial history, shows that this hope was unjustified.

Weakly positive Aschheim-Zondek reactions are often obtained in menopausal women, and may lead to a suspicion of pregnancy. In such cases it seems probable

that pregnandiol excretion will help to remove doubt, for while the occurrence of pregnandiol excretion may be merely the normal prelude to a fresh menstrual bleeding, its persistence at a subsequent estimation a fortnight or more later renders this very unlikely and a diagnosis of pregnancy almost certain.

Summary

Pregnandiol is a product of corpus luteum and placental metabolism. Its excretion in the urine is relatively easily measured in any biochemical laboratory. An attempt has been made to assess the diagnostic value of pregnandiol excretion in abnormal pregnancy. Its complete absence is nearly always evidence of serious abnormality, suggesting in early pregnancy the imminence of abortion and in late pregnancy the death of the foetus. The significance of a low pregnandiol excretion still remains uncertain. A normal pregnandiol excretion is not evidence that abortion will not occur or that the foetus is still alive. Both chronic nephritis and toxaemia of pregnancy may interfere with pregnandiol excretion. Deviations from the normal excretion in these conditions do not necessarily mean that the gestation is abnormal. Pregnandiol excretion seems assured of a place as a diagnostic aid in obstetric disorders.

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EFFECT OF REPEATED INTRAVENOUS INJECTIONS OF BILIRUBIN ON ERYTHROPOIESIS IN ANAEMIC DOGS

BY

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It is well known from animal experiments that regeneration after bleeding occurs more rapidly if a solution of the haemoglobin removed is reinjected into the anaemic animal (McMaster and Haessler, 1921; Miller and Rhoads, 1934). To explain this observation it has sometimes been assumed that as the injected haemoglobin is broken down some product or products are retained and re-utilized in the formation of new haemoglobin. The experiments of Hawkins *et al.* (1931, 1939) have shown, however, that this does not happen in the case of the pigment portion; since under experimental conditions in dogs with bile-renal fistulae 90 to 100 per cent. of pigment injected as haemoglobin is excreted in the urine, although at the same time an amount of new haemoglobin equivalent to 90 to 100 per cent. of that injected appears in the circulation. Other observations recorded in the literature and reviewed below indicate that injections of bilirubin do have an effect on erythropoiesis. If this effect is not due to an actual utilization of bilirubin in the formation of new haemoglobin it must be due to some other and at present unknown action of bilirubin on erythropoiesis.

Previous Observations

Patek and Minot (1934) reported the results of treatment with bile pigment in nine cases of chronic hypochromic anaemia. A concentrated almost pure preparation of beef bile pigments was given by mouth in doses varying from 1.2 to 2.5 grammes daily. This preparation given alone caused no reticulocyte response, but there was an average increase of approximately 7 per cent. in the amount of haemoglobin in about ten days. After a reticulocyte response had occurred as a result of the administration of a suboptimal dose of iron the addition of the bile-pigment preparation caused a second response. In one patient who had been treated with iron for fourteen months without reaching a haemoglobin level higher than 73 per cent. this rose to 85 per cent. in sixteen days when bile pigment was given in addition to iron. These observations seem to indicate that bile pigment given by mouth can in some manner facilitate either the absorption or the utilization of iron. It is open to question, however, whether they also show, as their authors claim, that bile pigment can be absorbed from the gastro-intestinal tract and utilized in the building of haemoglobin.

There are a number of articles in German describing experiments on the effects on erythropoiesis of bile and blood pigments given by mouth and by injection. Verzar (1929), for instance, claimed that various blood pigments, including haemoglobin, bilirubin, and porphyrins, as well as various organ extracts, were erythropoietic. He found that single doses of bilirubin given by mouth or by injection to rabbits caused a transient erythrocytosis in some animals—usually animals with a red cell count in the lower part of the normal range; an erythropenia was, however, produced in animals with a higher count. Regeneration after bleeding was said to occur more rapidly in animals given bilirubin intravenously or by mouth, but the diagrams illustrating this are hardly convincing and the results were apparently not consistent. Fellinger (1932) also found that a single parenteral injection of bilirubin caused an increase in the red cell count of normal rats in about half the animals so treated; and this occurred especially in young animals and in animals with lower red cell counts than the remainder. Continued administration led to a more prolonged increase, which ceased when the medication was discontinued. Regeneration after bleeding was said to be more rapid in animals treated with bilirubin than in animals not so treated; but in this instance again the protocols are not entirely convincing.

Zih (1939) found that the effect of intravenous injections of bilirubin in normal men depended on the dose given. A single dose of 10 to 30 mg. produced an erythrocytosis of short duration, but 150 to 300 mg. produced an erythropenia. Biliverdin gave a similar result, while haematoporphyrin had very little effect. A solution of 15 grammes or more of commercial haemoglobin taken by mouth also produced an erythrocytosis.

The effects of bilirubin on haematopoiesis are therefore, according to these authors, somewhat complicated. There is some evidence that bilirubin in small doses produces erythrocytosis, but that in larger doses it produces erythropenia. Erythrocytosis is most often seen in animals which have initially a red cell count in the lower part of the range of normal, and erythropenia may be seen in those with a higher red cell count. These authors have speculated as to the significance of the effects observed and have even ascribed to bilirubin the function of an erythropoietic hormone concerned in the maintenance of normal blood values. Some of their experiments are, however, open to criticism in that they were performed on small animals on which accurate blood counts are difficult, and the changes observed, which were slight, were sometimes not consistent. The experiments were of short duration, and too often red cell counts alone are recorded.

The object of the experiment reported here was to discover the effect of intravenous injections of bilirubin, given

over a considerable period, on the rate of production of haemoglobin, the size of the red cells, and the reticulocyte count of anaemic dogs. The dogs were made anaemic and kept so by bleeding, and the rate of production of haemoglobin was estimated by the amount of haemoglobin which it was necessary to remove in order that the animals should be kept at a constant level of anaemia, according to the method used by Whipple and Robscheit-Robbins (1925).

Methods of Present Experiment

The dogs used were adult mongrels of the foxhound type, weighing 13.7 and 13.75 kg. respectively. They were fed a constant diet of Gaines dog food* with no additions, and remained in good health throughout the time of the experiment. Free acid was present in a fasting specimen of stomach contents from each dog.

Blood counts were performed on venous blood removed by venepuncture with little or no stasis from the jugular or femoral veins. Red cell counts were performed by the usual methods and the percentage of haemoglobin was estimated by means of a Sahli haemoglobinometer so calibrated that 100 per cent. of haemoglobin was equivalent to 13.8 grammes of haemoglobin per 100 c.cm. of blood. The mean corpuscular volume was calculated from the red cell count and the percentage volume of packed cells, as determined by centrifuging a sample of blood for twenty minutes in a Wintrobe haematocrit tube. Reticulocyte counts were made by the dry coverslip method, the reticulocytes present in 500 red cells being counted. In the first eight days blood was removed by venepuncture till the animals' haemoglobin level was between 40 and 50 per cent. Throughout the rest of the experiment blood was removed once or twice a week in amounts sufficient to keep the haemoglobin percentage at this level.

Iron was administered in two ways in the periods shown on the chart. It was given by mouth as reduced iron in gelatin capsules in daily doses of 1 gramme. The capsules were placed on the back of the dogs' tongues and a few cubic centimetres of water were then poured into their mouths to induce them to swallow. Iron was also given by subcutaneous injection in the form of daily injections of 20 mg. of iron and ammonium citrate in aqueous solution. Pure bilirubin (Eastman Kodak) was given intravenously in doses of 50 mg. daily, dissolved in 10 c.cm. of hot decimolar sodium carbonate solution.

* Gaines dog food contains, according to its makers, beef, skimmed milk, egg yolk, beets, soya beans, whole wheat, yellow corn, rice, malt syrup, bone meal, calcium carbonate, cod-liver oil, and carotene. Analysis by weight: protein 23 per cent. (minimum), fat 3 per cent. (minimum), fibre 4 per cent. (maximum), carbohydrate 50 per cent. (minimum). Each dog was given approximately 1¼ lb. a day of the dry material.

Table showing Effect of Repeated Intravenous Injections of Bilirubin on Rate of Production of Haemoglobin in Dogs kept Anaemic by Bleeding

Period		Length of Period in Days	Dog 603		Dog 605	
			Total Hb removed in Grammes	Average Hb removed per Day in Grammes	Total Hb removed in Grammes	Average Hb removed per Day in Grammes
I	Bleeding down to anaemia level	10	188	18.8	192	19.2
II	Reticulocytosis	20	60	3.0	54	2.7
III	Control period	20	45	2.3	51	2.6
IV	Reduced iron 1 gramme daily by mouth	25	63	2.5	89	3.6
V	Iron and ammonium citrate 20 mg. daily by injection	21	74	3.5	117	5.6
VI	Reduced iron 1 gramme by mouth	20	122	6.1	118	5.9
VII	Reduced iron, 1 gramme by mouth and bilirubin 50 mg. intravenously daily	22	171	7.8	155	7.1
VIII	Reduced iron 1 gramme by mouth	27	170	6.3	159	5.9
IX		19	77	4.1	65	3.4
X	Control period	22	33	1.5	23	1.0
XI	Bilirubin 50 mg. intravenously daily	18	37	2.1	21	1.2
XII	Bilirubin 50 mg. intravenously and reduced iron 1 gramme by mouth daily	14	52	3.8	35	2.5

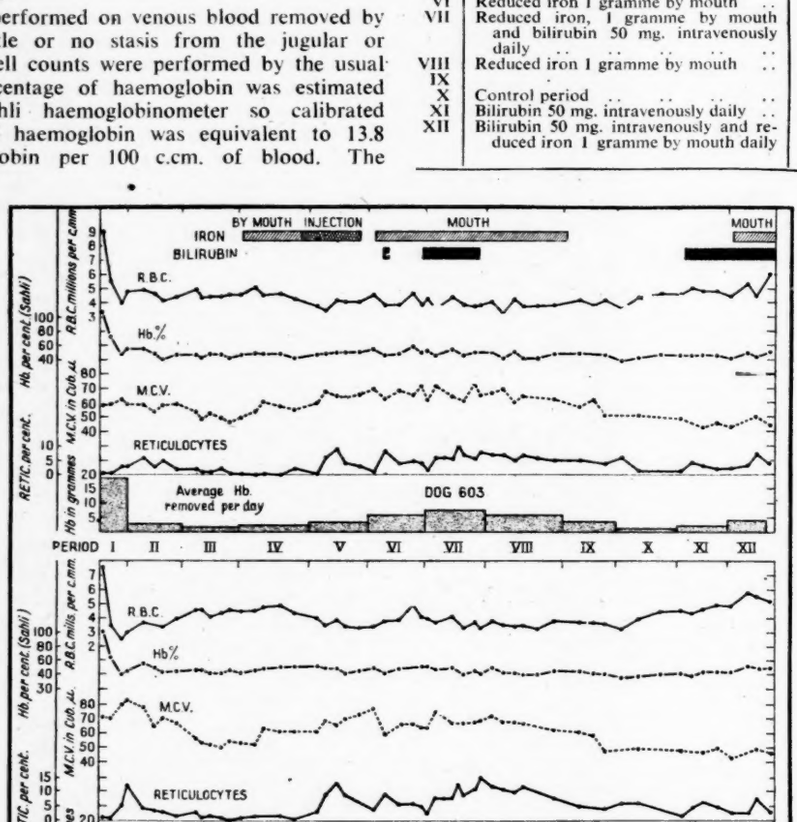

Chart showing effect of repeated injections of bilirubin on percentage of reticulocytes and rate of production of haemoglobin in two dogs kept anaemic by bleeding.

Results

The results obtained are shown in a chart and in a table, in which the time of the experiment has been divided into periods numbered I to XII. In Period I, lasting ten days, the two animals were bled down to a level of haemoglobin of 40 to 50 per cent., the average daily amount of haemoglobin removed being 18.8 and 19.2 grammes respectively. In Period II, lasting twenty days, which includes the subsequent reticulocyte response, the amount of haemoglobin removed each day was 3 and 2.7 grammes. Period III, lasting twenty days, is taken as a control period, during which the average daily amount of haemoglobin removed was 2.3 and 2.6 grammes. In Period IV, lasting twenty-five days, iron was given by mouth in the form of reduced iron in doses of 1 gramme daily. The average daily amount of haemoglobin removed increased slightly to 2.5 and 3.6 grammes respectively, but no significant increase in the percentage of reticulocytes was observed. During Period V, lasting twenty-one days, iron was given by subcutaneous injection in the form of iron and ammonium citrate in doses of 20 mg. daily. The average daily amount of haemoglobin removed increased to 3.5 and 5.6 grammes respectively, and reticulocyte responses, with peaks of 8 and 13 per cent. respectively, occurred in each dog. In Period VI, lasting twenty days, the animals were again given reduced iron by mouth. Three days after the beginning of this period they were given in addition daily intravenous injections of 50 mg. of pure bilirubin dissolved in 10 c.cm. of decimolar sodium carbonate. After two injections there was

a sharp rise in the reticulocyte count. The significance of this rise was doubtful, and injections of bilirubin were therefore discontinued for the remainder of this period in order to eliminate the possibility that the reticulocyte responses were due to some cause other than the administration of bilirubin. Periods V and VI therefore serve to show that a raised reticulocyte count could not be maintained by the administration of iron alone, given either by injection or by mouth. During Period VII, lasting twenty-two days, the administration of iron by mouth was continued together with daily intravenous injections of 50 mg. of bilirubin. There occurred a prompt reticulocyte response, the percentage of reticulocytes rising to the highest figures (10 and 15 per cent.) recorded for each dog throughout the experiment, and remaining above normal for seventy to eighty days and long after the administration of bilirubin had been discontinued. The daily average amount of haemoglobin removed rose to the highest figures recorded—7.8 and 7.1 grammes respectively. In Period VIII, lasting twenty-seven days, the administration of iron by mouth was continued, but the injections of bilirubin were discontinued. The reticulocyte count fell slowly, but remained considerably above normal, and the average daily amount of haemoglobin removed decreased to 6.3 and 5.9 grammes respectively. In Period IX, lasting nineteen days, neither iron nor bilirubin was administered; the reticulocyte count decreased, but remained above normal, and the daily average amount of haemoglobin removed was 4.1 and 3.4 grammes respectively. During Period X, which is taken as a further control period, the reticulocyte count returned to normal and the daily average amount of haemoglobin removed was 1.5 and 1 gramme respectively. In Period XI, lasting eighteen days, bilirubin was administered as before, but no iron was given. On this occasion there was a small reticulocyte response (to 4 and 6 per cent. respectively), and the average daily haemoglobin removed increased slightly to 2.1 and 1.2 grammes respectively. During Period XII, lasting fourteen days, the daily injections of bilirubin were continued, and in addition iron was administered by mouth as before. There was a further reticulocyte response (to 7 per cent. in each dog), and the daily average amount of haemoglobin removed increased to 3.8 and 2.5 grammes respectively.

The changes which took place in the mean corpuscular volume are recorded in the chart but will not be further discussed. A decrease in the colour index (indicated by divergence of the lines representing red cell count and percentage of haemoglobin) occurred in periods of iron deficiency, and the reverse was experienced in periods in which iron was administered for any considerable time.

Discussion

The experiment shows that repeated intravenous injections of pure bilirubin had a considerable effect on erythropoiesis and on the production of haemoglobin in two dogs kept anaemic by bleeding. This effect consisted of a prompt reticulocyte response, which lasted for some seventy days and continued for some fifty days after the injections of bilirubin had been discontinued, and an increase in the amount of haemoglobin that had to be removed to keep the animals at a constant level of anaemia. The differences between the amount of haemoglobin removed daily in Periods VI and VII may appear small in the chart, but they actually represent increases of 20 and 28 per cent. respectively in the amount of haemoglobin produced by the two dogs. It must also be remembered that two injections of bilirubin had been given to each dog early in Period VI; and as they brought about a noticeable reticulocyte response they may also have caused some increase in the amount of haemoglobin produced in this period.

It does not seem wise to do more than speculate as to the nature of the mechanism of this effect of bilirubin injections on the production of haemoglobin. Comparison of Period IV (iron by mouth without bilirubin) with Periods VII and XII (iron by mouth with bilirubin) suggests that the bilirubin acted by improving in some way the absorption or the utilization of iron. This suggestion, however, requires close scrutiny, for though on a given amount of iron by mouth haemoglobin production was much greater in Period VII (with bilirubin) than in Period IV (without bilirubin) the periods are not comparable; at the beginning of Period IV the animals were in a state of iron deficiency, but this was not the case at the beginning of Period VII, when they had been receiving iron in some form for seventy days. Periods IV and XII are more comparable, since in each case the animals had received no iron for some fifty days. Though the average daily amount of haemoglobin produced by the two dogs is about the same in these two periods the increase in the amount of haemoglobin produced in Period XII over that produced in Period XI (81 and 108 per cent. respectively) was much greater than the increase in Period IV over that in Period III (9 and 39 per cent. respectively). Moreover, in Period XII there was a significant reticulocyte response, whereas in Period IV there was none. There is therefore some evidence to suggest that bilirubin given by intravenous injection improves the absorption or the utilization of iron.

Whether or no this is the case, comparison of Period VII with Period XI indicates that iron deficiency limits the effect of bilirubin; for in Period VII (administration of iron and no previous iron deficiency) the effect of a given amount of bilirubin on the reticulocyte count and on the production of haemoglobin was far greater than in Period XI (administration of bilirubin without addition of iron to animals in a state of iron deficiency).

A simple explanation of the findings would be that after repeated bleedings the animals were short of unknown pigment precursors of haemoglobin as well as of iron, and that the bilirubin could be utilized to fill this deficiency. If this was the case administration of either substance might be expected to reinforce the effect of administration of the other. As discussed, however, in the introduction to this paper, the experiments of Hawkins *et al.* on the effects of injections of haemoglobin make the supposition that injected bilirubin is actually utilized in the formation of new haemoglobin seem improbable. The question could be settled by repeating the experiment reported here on dogs with bile-renal fistulae, in which accurate estimations of the amount of pigment excreted can be made.

The suggestion that bilirubin acts as an erythropoietic hormone—that a product of the destruction of haemoglobin stimulates increased activity of the bone marrow and the formation of new haemoglobin—is an attractive but as yet hypothetical one.

Summary

An experiment was made on two anaemic dogs to discover the effect of repeated intravenous injections of pure bilirubin on the rate of production of haemoglobin, the size of the red cells, and the reticulocyte count.

It was found that the injections of bilirubin caused an increase in the rate of production of haemoglobin and a prolonged reticulocyte response.

It is a pleasure to express my gratitude to the Rockefeller Foundation for an opportunity of working in America; and to the Director of the Hospital of the Rockefeller Institute for Medical Research for hospitality in that institution. I am also much indebted to the members of the haematological service at the hospital, and particularly to Dr. C. P. Rhoads, for all their kind assistance and encouragement.

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A CASE OF DUAL (KISS) CANCER OF THE STOMACH

BY

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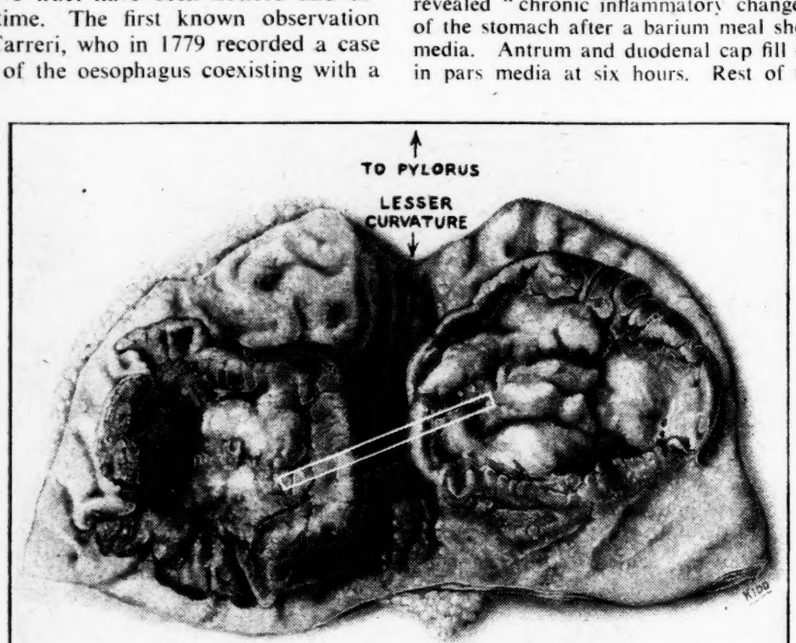
Cases of double cancer of the stomach are rare enough to warrant publication. A review of the available literature shows that multiple malignant neoplasms of the alimentary canal are far from frequent. Benign polypi, such as those that occur in the large bowel, are, of course, fairly common. It appears, however, that multiple cancers in the digestive tract have been noticed and described for a long time. The first known observation seems to date from Carreri, who in 1779 recorded a case of "scirrhous cancer of the oesophagus coexisting with a malignant growth in the small intestine."

Multiple neoplasms are more frequent in the intestine than in the stomach. The coexistence of a gastric tumour and one or more intestinal tumours is by no means exceptional. In the stomach itself, however, neoplastic duplication is exceptional and probably a very rare occurrence. Barth in 1855 described a case of cancer of the cardia coexisting with a cancer of the pylorus, while Devic and Chatin described a similar case in the *Province Médicale* in 1892. Pellegry noted that different writers had from time to time described simultaneous cancers of the cardia and pylorus. More recently cases of double cancer of the stomach have been described in the French and Italian journals. Thus Barbier, Cavailher, and Didierlaurent (1938) discuss a case of cardiac and prepyloric cancer of the stomach. Pellegry in 1926 wrote a thesis on multiple cancers of the stomach, covering a period of twenty-six years, and managed to unearth from medical literature six cases in which two definitely primary cancers of the alimentary canal coexisted simultaneously—namely, tongue and jejunum, pharynx and pylorus, oesophagus and ampulla of Vater, oesophagus and stomach (two cases), oesophagus and pylorus. In these cases it was easy to establish the primary nature of the tumours, as the proximal one in each instance showed a squamous-celled structure, while the distal one showed a different structure —namely, spheroidal-celled or adenocarcinoma. When double cancerous growths occur in the same segment of the digestive tract, as in the stomach, the relation between the two tumours becomes extremely difficult. It is often impossible, from histological appearances, to state whether the two tumours are independent or whether one is secondary to the other; but there is no reason why two primary cancers possessing the same histological structure should not develop simultaneously. Direct implantation by contact is a mode of spread which must be admitted as possible. On the other hand, if this assumption be accepted, why are multiple tumours of the stomach not observed oftener?



Case Report

A labourer aged 34, the father of seven children, was admitted to the Birkenhead Municipal Hospital on October 26, 1939, complaining of epigastric discomfort of twelve months' duration, relieved by food and alkalis. There was an increasing loss of appetite and of weight, but no vomiting.

On examination the patient was seen to be of spare build. No adventitious sounds were heard in the chest, and no heart abnormality was detected. The blood pressure was 115/80. Slight epigastric tenderness was present, but no mass was palpable in the abdomen. The urine was acid, and had a specific gravity of 1020, but no abnormal constituents. The Wassermann reaction was negative. Radiographs of the chest revealed "chronic inflammatory changes only." Radiographs of the stomach after a barium meal showed: "Defect in pars media. Antrum and duodenal cap fill evenly. Trace of meal in pars media at six hours. Rest of tract normal. Appearances suggest carcinoma ventriculi." Examination of the faeces for occult blood was negative. The blood picture was: red cells, 3,100,000 per c.mm.; leucocytes, 16,000 per c.mm. No abnormal cells were present. The sputum was tubercle-negative. A fractional test meal showed achlorhydria.

Operation (E. W. T.): This was performed on November 27 under high spinal anaesthesia, using 12 c.cm. hypobaric 1/1,500 percaine, and employing the ventral position for injection as advocated by Macpherson of Hull. One-third grain of morphine and 1/100 grain of hyoscine were given one hour and 1½ grains of ephedrine fifteen minutes before operation. The abdomen was opened through a midline epigastric incision. The body of the stomach was occupied by a mass which appeared to encircle it and also to infiltrate the transverse mesocolon posteriorly. There were a few enlarged glands in the omentum and along the lesser curvature, but no metastases in the liver or pelvis. A partial gastrectomy was performed according to Finsterer's technique; the abdomen was closed, and the patient given a pint of Group O (IV) stored blood, by transfusion, immediately on return to the ward. The operation lasted two hours.

On opening up the specimen removed I discovered that two malignant ulcers were present—one on the anterior and the other on the posterior wall, immediately opposite each other. They were exactly the same size and presented similar macroscopic characters—rolled everted edges and sloughing base. (See drawing of specimen taken after fixation.)

Convalescence proved somewhat stormy in consequence of a good deal of post-operative vomiting, which continued for seven days. This, however, settled down with frequent gastric lavage. The patient was discharged from hospital two months after operation, feeling quite fit and steadily gaining weight. The eventual prognosis must of necessity be a guarded one. When seen in April, 1940, the patient had gained 1 st. in weight and was feeling fit in every way.

Discussion

The question arose as to whether these ulcers were two separate and primary cancers or a large growth ulcerating in two places. To exclude the possibility of this being a

single growth which by submucous extension across the lesser curvature had produced a saddle-shaped plaque with an area of ulceration on each side, a section was taken as shown in the drawing. It included the growing edge of each growth, at the point where the cancers approached nearest to each other, with the intervening stomach wall of the lesser curvature, and this showed unequivocally that there was no direct bridging connexion between the two growths. It was therefore established that in this case the condition was either one of two distinct primary gastric adenocarcinomata or that one of the two growths represented a contact transplantation from the other at an early stage of its development by a process analogous to the development of kissing ulcers in the duodenum.

I am indebted to Professor T. B. Davie, University of Liverpool, for his kindly help and criticism as well as for the microscopical reports and sections. My thanks are also due to Mr. R. A. Grant, medical superintendent, for permission to publish this case.

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PSYCHIATRIC CASUALTIES IN LONDON, SEPTEMBER, 1940

BY

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In the *Journal* of October 14, 1939 (p. 764) I reported cases brought to a London hospital suffering from a variety of psychiatric conditions which had occurred under the stress of the times. Then the fear which was the precipitating factor in their illness was largely of the unknown terrors of air raids which did not come. In a few cases the sirens were an actual stimulus.

September, 1940, at the same hospital forms an interesting contrast. In the latter part of August the Central London population became accustomed to sirens, and a year of war had eliminated by a process of voluntary evacuation many neurotic and potentially neurotic people. Cases of neurosis in which a large element of causation could be attributed to the war were nevertheless occurring. In particular there were relapses among the war neurotics of 1914–18. When intense air warfare broke out over London on September 7, neurotic cases began to appear among those who had been in actual danger, who had been knocked down by blast, or who had been in houses which were rocked or wrecked by high-explosive bombs. Unlike those previously seen, these had experienced actual threat of injury and death. The earlier less concrete threat claimed its victims from a more highly educated, intellectual, and responsible section of the population.

Attributability

In discussing the neuroses of war, whether in the armed Forces or in the civilian population, there has been much argument as to what cases can truly be said to have been caused by war stress; and the idea has become prevalent that if a patient has shown the least sign of neurosis in his previous history he cannot rightly be called a war neurotic. Experience of clinical material such as that described below will reveal how superficial such an argument is. If it is remembered that there exists no absolute dividing line between neurotic and non-neurotic and that probably everyone has some trace of neurotic reaction in his adjustment to reality it will become obvious that any distinction must be quantitative rather than qualitative. It must be decided not whether a patient was previously neurotic but to what extent any previous neurosis is responsible, jointly with present stress, for his condition.

In considering the first 29 cases seen since September 7, therefore, the test of estimating the state of the personality upon which the precipitating factors have been at work has been performed by asking the following questions: (1) Was the patient neurotic previous to the circumstances which are said to have caused his illness? (2) If the answer to the first question is negative: Was the patient nervous or highly strung or unduly apprehensive previously, though not to the extent of being recognized as neurotic or ill?

If the second question is answered in the affirmative the patient must be regarded as an air-raid casualty, though somewhat predisposed. If the first question is answered in the affirmative each case must be considered separately. But the additional question, Would the patient be in his present condition were it not for air raids? is almost invariably answered in the negative. There must therefore be in all these cases some element of war attributability. I have attempted to decide whether in this class of case the present stress or the previous neurosis was the more important factor. Where the present stress seemed to be more important the case was considered to be an air-raid casualty. The results of this survey are given in Table I.

TABLE I (*29 Cases*)

A: Cases in which there was a history of pre-existing neurotic illness (4 are considered *mainly* attributable to war stress)	9
B: Patients with no such history, but said to have been nervous or highly strung	10
C: Cases showing no discoverable predisposing factors	3
D: Patients showing mild psychotic or psychopathic personalities	4
E: Cases complicated by concussion	2
F: Negative—Patient refused examination	1

Categories B and C are almost entirely attributable to war stress; Category A is partially and to a variable degree attributable to war stress (4 cases, however, are considered principally to be so attributable); and Categories D and E are attributable only to a minor degree. Thus there are 17 cases which owe their causation principally to war stress.

Clinical Material

The majority of cases were brought in from the scene of a bomb explosion suffering from some degree of derangement of consciousness, varying from a completely unconscious or stuporous condition to a mildly dazed state. There was often some amnesia in those not unconscious or stuporous. Tremor, usually generalized and coarse, was common, and became much exaggerated on near gunfire. It was usually accompanied by uncontrolled emotional behaviour and weeping—in men as well as women. One case of localized hysterical paralysis was seen—in a long-standing and versatile hysteric. Only one case of hysterical exaggeration of slight injuries was seen.

Typical Cases

Case 1 (Gross hysterical symptoms in a woman not previously neurotic, but of a well-marked hysterical personality type).—A married woman aged 35 was brought in unconscious and rigid with limbs flexed, head rotated to the left, and hands tightly clenched. Her pulse rate was 130 and the volume poor. This woman had lost a sister-in-law, killed in an air raid the day before. She had been frightened in previous air raids in a badly bombed area in South London. When the mews in which she lived was hit by a bomb she was thrown off her feet. She was brought immediately to hospital, and responded well to treatment—full relaxation and movement, together with speech, being restored within half an hour. The following night under bombardment she began to relapse into a similar state, but this was easily rectified. She slept well with adequate hypnotics, but though now showing no florid hysterical symptoms she is quite incapable of dealing reasonably with her fear, and has been strongly

advised to leave London and seek psychotherapeutic treatment in the Provinces.

Case 2 (complete loss of power in all limbs, without loss of consciousness but with considerable amnesia).—A girl aged 16 was sitting in a lorry waiting for her brother to come and meet her when a bomb fell within thirty yards. She fell or was thrown on the floor of the drivers' cab, and could not get up. She was brought to hospital unable to move any limb or to talk at first, and with feelings of emptiness and numbness all over her body. There were no physical signs suggesting organic injury. The pulse rate was 130. On encouragement she quickly regained the use of her limbs and faculties, but retained some amnesia for the events experienced. Subsequently this was also resolved by suggestion. She left hospital within two hours of her arrival. A week later she came to report that she was very well.

Case 3 (exhaustion and acute anxiety state of depressive type).—A man aged 44, an air-raid warden, had been on night duty in a badly bombed area for a fortnight. During the daytime he carried on his usual job as a warehouseman. He had thus lost much sleep. He collapsed at work and was brought to hospital. He was shivering violently, and occasionally his whole body went into clonic contractions. He sobbed uncontrollably at times. After his admission the clonic attacks and shivering soon passed off, but they left him tremulous and tearful. Reassurance and explanation were given and sleep was secured with adequate hypnotics. He was much better in two days, but relapsed on leaving hospital. He was sent to a psychiatric hospital outside London for further treatment. This man had served many months in France during the last war, and later in Salonika he had suffered from "malaria and shell-shock," and was invalided out of the Army on a 50% pension. After a few months the pension had come to an end. He had been nervous but not neurotically ill in the interval.

Case 4 (gradual onset of severe anxiety symptoms with great deterioration of self-respect and personal standards).—A male clerk aged 39 had been working for some weeks on night duty in an aircraft factory near London. When the intense bombing started he left work and wandered about London from shelter to shelter, eventually taking to the Underground and becoming a veritable troglodyte. He only emerged to pawn clothes, watch, and so on, in order to buy food. He was admitted in a state of great exhaustion, with generalized tremors and rapid pulse, and was quietly weeping. He has a chronic cough, having smoked immoderately for years, and has pronounced vasomotor instability, blushing very easily. He has been rather a rolling stone, but could always get a good job, and, though nervous, had never previously been frankly neurotic.

Case 5 (anxiety state in a well-balanced woman).—This patient, a widow aged 45, works in a responsible domestic position in a large hotel. She lives alone in rooms and was the only occupant of the house who did not sleep in a shelter. She had no fear of air raids. The next house received a direct hit and she was thrown out of bed and hit by falling plaster. She was able to put a coat on and escape downstairs and to the street. She was brought to the hospital sobbing and shaking. Beyond a rapid pulse there were no physical signs except for a few bruises. She protested that she must be at work at 6 a.m. next day, and was with difficulty persuaded to stay in bed and take a sedative. She was much better in the morning and left the hospital. Two days later she returned, reporting that she was more shaken than she had expected, could not sleep, and was apt to burst into tears in a way very foreign to her. She has, however, carried on with her work, and in another two days has made further improvement, but is unable to stand air raids now and wishes to leave London.

Case 6 (an ex-soldier of this war, an untreated case of war neurosis, relapsed under the stress of air raids).—A man aged 25 was admitted in a state of extreme terror, having been sent from an air-raid shelter. Gross generalized tremor became violently exaggerated and his back arched into opisthotonos when gun-fire was close at hand. He was sweating and weeping, and said that he experienced violent pains at the sound of the detonations. He had been for seven years in the Royal Engineers, having joined with a twin brother. In Belgium he saw his brother hit by a high-explosive shell burst. He was himself slightly injured, and the two were taken to hospital, where his brother died within a few hours, after amputation of both legs. The patient was sent back to England when the hospital moved home. Shortly afterwards he was boarded out, presumably on account of his neurotic condition. A minor injury to a knee had quite recovered. He soon found a good job, and was doing fairly well when the air raids started, precipitating his dramatic relapse.

Treatment

It is unusual for a psychiatrist to see his cases so soon after they have developed their symptoms. Many are entirely comparable to cases of so-called traumatic neurosis following accidents at work. The rapid response of many air-raid cases to early treatment suggests that industrial cases so treated might lose much of their bad prognosis.

Each case is seen at the earliest possible moment, and the incidents leading up to the breakdown are gone over with the patient in great detail. If the patient is unconscious he is treated as if he had been hypnotized for therapeutic purposes and is given repeated reassurance, specifically referred to the use of limbs and faculties, together with simple explanations of the mechanism involved in the formation of his symptoms. He is then gently commanded to open his eyes and to give his name and address. The physician may feel somewhat overawed by the complete inertia of the patient to whom he is talking. However, the majority of patients do respond eventually. If success seems unlikely or if the patient is excitable or disoriented he may be told that he will be given a sleeping draught and that on waking he will find his mind clear and his memory complete. In all cases the patient is seen again the next day and the whole story is talked over again. If the memory is still not complete (two patients had amnesic gaps of nine months and several years respectively) reassurance is given and he is told to expect the gradual filling in of his amnesia during the next few days, which he is encouraged to spend largely asleep. Large doses of paraldehyde (up to 3 drachms) and small doses of sodium barbitone (5 grains) are used in combination as a hypnotic draught, and will usually succeed in putting the most excitable patient to sleep even during a heavy bombardment. No sedative is given in the daytime. If a patient is not well enough to leave hospital in three days he is sent to an emergency psychiatric hospital outside London. The results of such treatment are given in Table II.

Table II

Successfully treated as out-patients	6
Successfully treated in three days as in-patients	10
Referred to psychiatric base hospital	11
Psychotic: sent to observation ward	1
Refused treatment	1

The permanence of the adjustments so achieved is, of course, uncertain, and the success is largely in dealing with the florid superficial symptoms. Obviously, no attempt can be made at adjusting the deeper personality anomalies, and recurrence of symptoms is probable in at least a proportion of cases.

Conclusions

These brief notes have been written in the midst of the circumstances from which the cases arose. The report is therefore more topical than considered. It is intended primarily to show that psychiatric war casualties have occurred, though to a surprisingly small extent so far.

Early diagnosis and treatment give results far better than peacetime experience would lead one to expect. A

number of cases occur, however, which do not so readily respond, and these are not always patients previously neurotic, though this is the general rule. Many cases arise in those not previously overtly neurotic but of a nervous or highly strung disposition. A few cases are seen in which no trace of predisposition can be found, but it is ridiculous to regard these as the only true psychiatric casualties of the air raids.

No claim is made for originality in the methods of treatment employed. All were used in the last war, and it was from those who introduced them that I have learnt them.

Summary

The conditions under which cases of neurosis have occurred in recent weeks in London are briefly considered and contrasted with those of September, 1939.

The question of attributability to war stress is discussed.

Six typical cases are reported.

Therapeutic measures are briefly described.

TREATMENT OF ANAEMIA BY TRANSFUSION OF CONCENTRATED SUSPENSIONS OF RED CELLS

BY

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AND

P. L. MOLLISON, M.B., M.R.C.P.

(*From the S.W. London Blood Supply Depot*)

Transfusion with a suspension of red cells in saline is no new method of therapy. In 1918 Oswald Robertson published a description of a method of preparing suspensions of preserved red cells in gelatin saline for the transfusion of patients with anaemia. His work was based on the experiments of Peyton Rous and Turner (1916). In Robertson's series the cells were diluted to 50% of their original concentration before transfusion. In 1937 Castellanos called attention to the advantages of a concentrated cell suspension and reported successful results. No other workers appear to have concerned themselves with this study until recently, when, with the setting up of blood banks in various countries, pathologists have presumably been stimulated by the sight of bottles containing separate layers of plasma and red cells. In America at least one institution (the Cook County Hospital) now provides a suspension of red cells in normal saline for use in anaemic states. This suspension, however, is more dilute than normal blood.

Lately it has become evident that plasma is much more easily stored than blood, and since it appears to be an adequate substitute for whole blood, in the treatment of shock at least, much of it is being prepared in the London depots. The plasma is pipetted off from bottles of blood that have been allowed to stand for six days. Thus large numbers of bottles containing only red cells remain, and until now no definite use has been suggested for them.

About six months ago we started using a red cell concentrate in the treatment of certain cases of anaemia. Over fifty transfusions have now been given, and the results enable us to put forward some tentative conclusions as to the uses and advantages of this method of therapy.

The Cell Concentrate

Originally the concentrate was prepared from stored blood from ten to fourteen days old. The plasma was pipetted off, and with it the gel which lies between the red cells and the plasma. This gel is formed mainly from the breakdown of leucocytes, and is probably identical with the "clots" which may hamper the administration of stored blood. The highly concentrated red cell suspension that remained was fluid enough to be poured, and the contents of one bottle were added to another. To this mixture 50 c.cm. of 1.1% saline solution with 1% glucose was added; thus one bottle containing approximately 430 c.cm. of a highly concentrated red cell suspension was obtained, and this was the unit employed in most of our transfusions.

Hypertonic saline was used as a diluent because it was found to produce less haemolysis of the red cells than normal saline. We have since found that haemolysis can be further reduced by adding 8% instead of 1% glucose; this ensures a concentration of glucose of at least 1% in the final mixture. Hypertonic saline is necessary presumably because the citrate saline into which the blood is originally taken is hypertonic (Maizels and Whittaker, 1939), and cells stored with this fluid become hypertonic to normal saline.

Lately, as we have stated, many bottles containing only red cells have become available as a by-product from the preparation of plasma. Actually these bottles contain about 50 c.cm. of plasma above the red cell layer. The preparation of a concentrated cell suspension for transfusion is thus greatly facilitated, since it is only necessary to add the contents of one bottle to another to obtain approximately 480 c.cm. of fluid that contains the haemoglobin equivalent of two bottles of stored blood.

This second method of preparation, though simpler, has the disadvantage of leaving the leucocyte gel in the bottle. We have the impression that suspensions prepared in this way give rise to more reactions than do the saline suspensions. It seems possible that the leucocyte gel may therefore be at least partly responsible for the rather high reaction rate found in our series of transfusions with whole stored blood. This supposition receives further support from the fact that plasma transfusions seem practically reaction-free even when the plasma is prepared from stored blood. If the transfusion of suspensions of red cells is also associated with very few reactions suspicion must fall upon the leucocyte gel.

In preparing the concentrated suspension by either method particular care must of course be taken to avoid infection. It is advisable to use the suspension as soon as possible after it has been prepared.

Administration

The cell suspension may be given through an ordinary administering apparatus. If the leucocytes are not removed it is advisable to use a gas-mantle filter (as recommended by Maizels) or some other type with a large filtering surface. The red cell suspension was not warmed before administration because we desired to compare the reaction rate with that in a series in which we had used unwarmed whole stored blood. In many cases the blood was below room temperature on reaching the patient. The rate of administration and the amount given varied with the clinical condition of the patient.

One bottle of the cell suspension usually raises the haemoglobin approximately 10 to 15%. For instance, in one case, following a transfusion of six bottles of the cell concentrate, the haemoglobin rose from 26 to 90% and the red cells from 1,200,000 to 5,050,000 per c.mm.

The use of concentrated red cell suspensions is contraindicated in cases of shock, where the immediate need is to restore blood volume rather than to increase the number of erythrocytes.

Reactions

In the table the reactions obtained are compared with those seen in a previous series using stored citrated whole

Reactions.

	Age of Blood (in Days)	No. of Cases	No Reaction	Reactions	
				Grade II	Rigors
Whole stored blood ..	3–9	9	6	2	1
	10–14	36	21	6	9
Total		45	60%	18%	22%
Cell suspensions ..	3–9	14	13	1	0
	10–14	32	26	2	4
	15–30	15	14	1	0
Total		61	87%	6.5%	6.5%

blood. As previously mentioned, the blood was never warmed before transfusion. All the cases were observed personally, and the temperature was taken every half-hour during the transfusion and for the next two hours.

Reactions may be classified as follows (Riddell, 1939). Grade I: rise of temperature to 100° F.; no other objective features. Grade II: similar or greater rise of temperature, with a feeling of cold or shiveriness but no actual rigor. Grade III: definite rigor. No jaundice or haemoglobinuria was encountered. Since Grade I reactions are symptomless it is on the whole misleading to include them in the "reaction rate," as they will only appear in a series which is being closely investigated.

As will be seen from the table the incidence of definite rigors was as high as 22% with whole stored blood, whereas only 6.5% occurred when the cell suspension was given. Furthermore, the blood given in the concentrated form was distinctly older on the average.

A striking example of this freedom from rigors was the case of a woman aged 43 who was suffering from acholuric jaundice. She had had five previous transfusions of whole blood, all followed by rigors. Following a splenectomy she was given six bottles of the cell concentrate over a period of thirty-six hours. No rise of temperature occurred and there were no symptoms referable to the transfusion.

Cases of acute haemorrhage have been excluded from both series, since it is usually believed that such cases have a particularly low reaction rate. Urticaria occurred in 7 of the 45 patients who were given stored blood. In the 61 who received cell suspensions, however, no urticaria was seen. This might have been expected from a theoretical consideration of the subject.

Summary

A method is described for the preparation and use of a concentrated red cell suspension.

It is suggested that this concentrated suspension has the following advantages over whole stored blood in the treatment of anaemia: (*a*) Less than half the usual volume of fluid will produce the same rise in haemoglobin. (*b*) The plasma of whole stored blood can be saved for a shocked patient. (*c*) Reactions are fewer. (*d*) The danger of transfusing potentially incompatible agglutinins when using Group O (IV) blood is greatly lessened.

Sixty-one cases have been treated with the cell concentrate; the incidence of rigors was 6.5%. This figure is contrasted with that found in a similar series of transfusions with whole stored blood, in which 22% of rigors occurred.

We should like to thank Dr. J. O. Oliver, former director of this depot, and Dr. O. M. Solandt, his successor, for permission to carry out this work. We should also like to thank Mr. E. J. Lucas for preparing the suspensions.

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Clinical Memoranda

Sulphaemoglobinaemia following Prolonged Administration of Phenacetin

The report of a case of chronic cyanosis from acetanilide poisoning by Drs. T. N. Morgan and A. Greig Anderson in the *Journal* of August 10 (p. 187) prompts us to record briefly a recent case of sulphaemoglobinaemia following prolonged dosage with the related drug phenacetin. The latter, by virtue of its inclusion in veganin and "A.P.C." tablets, is now being ever more widely used, so that it may well account for increasing numbers of patients presenting themselves with cyanosis.

CASE REPORT

A clerk was admitted to Guy's Hospital on January 16, 1940, for polyarthritis of fourteen months' duration. Previous to admission he had been under the care of Dr. J. P. Conway and had been taking a fair amount of aspirin and some veganin in order to mitigate pain.

On January 18 he was transferred to the sector base hospital, where the ward sister noted that he had a rather dusky complexion. From that time he continued to receive some phenacetin each day, the actual amount varying between 3 and 18 grains during the twenty-four hours. The patient is now strikingly cyanotic, and his appearance is a feature of the ward. As none of the usual causes of cyanosis seemed to be operative, and as the haematological findings revealed no abnormality beyond a slight anaemia (red cells 4,500,000 per c.mm. and haemoglobin 76%), a sample of his blood was investigated for the presence of abnormal pigments. On July 17 Dr. S. J. Hopkins carried out a spectroscopic examination and reported that the characteristic band of sulphaemoglobin was well marked.

COMMENT

Two points arising out of this case call for some comment. The first is that the patient on March 18 received an injection of solganal B, and he himself dates his colour change from that occasion. The sister who first noticed his peculiar hue in January also agrees that it became more pronounced after the injection of gold. We have been unable to trace any instance of gold salts having produced sulphaemoglobinaemia of themselves, but we have seen the suggestion made by some workers (Findlay, 1939) that the activity of aurothiosulphate may depend on the sulphur-containing part of the molecule rather than upon its gold. With this suggestion in mind it seems reasonable to conjecture that in the present case the earlier cyanosis may have been due to methaemoglobin, and the solganal may have precipitated the further formation of sulphaemoglobin. It may be added parenthetically that this cannot be a case of "chrysiasis." The latter variety of pathological pigmentation resulting from gold therapy is only seen after the treatment has been persisted with for a matter of years, and is, of course, due to actual deposition of gold in the patient's skin (Kochs, 1938).

The other interesting point is that on July 25 the patient was given an intravenous injection of 10 c.cm. of 1% methylene blue, and was declared by several neutral observers who saw him within two hours to have become appreciably pinker. This effect is in contrast with a previous observation (Wendel, 1939), when it was found that the cyanosis due to sulphaemoglobinaemia was unaffected by methylene blue, although that due to methaemoglobinaemia was readily abolished.

The question of possible addiction to phenacetin cannot be fairly discussed in relation to the present case, since the preparation used also contained codeine, whose innocence in this respect is not unimpeachable. However, the patient has continued to take his phenacetin and is now as blue as ever, but, apart from this and some disability resulting from his joint condition, he remains well and very contented.

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J. P. CRAWFORD, L.R.C.P., M.R.C.S.

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Reviews

MASS PSYCHOLOGY

Beyond the Clinical Frontiers: A Psychiatrist Views Crowd Behaviour. By Edward A. Strecker, A.M., Sc.D., Litt.D., M.D. (Pp. 210. 9s. 6d. net.) London: Chapman and Hall. 1940.

Professor Strecker tells us that when he took up his first post in a mental hospital he asked the medical superintendent, "What is sanity?" and was informed that it was a capacity for being dexterous enough to keep out of asylums! This saying has evidently deeply tinged his subsequent thinking. On the one hand it has made him sympathetic with his patients, whom he regards as having enough individuality to reject the demands of a preposterous world by insisting firmly on the validity of their own premises. On the other hand, it has also made him cynical as to the value of the mass reactions of those outside the walls of mental hospitals. Both groups he regards as characterized by a retreat from reality. Like many other psychiatrists he uses the florid manifestations of those admittedly insane as a key to the understanding of the curious behaviour of the mass-mind. Whatever psychiatry has gleaned from its patients has been made available for mental hygiene. In this country we are accustomed to speak of the man in the street, implying a belief that he holds an individual common-sense view; Professor Strecker prefers to speak of the crowd-man, whose reactions are mainly determined by mass psychology. Those who know the United States will appreciate his point. He then proceeds to discuss what he calls first aids to reality evasion, which are widely employed, some innocent, others harmful both personally and socially. Thereby the crowd-man becomes an easy victim of propaganda. No finesse is required; merely shopworn platitudes, slogans, symbols, and the flimsiest generalizations are needed. He uses the convenient label "stereotype" for the man whose principal aim in life seems to be to standardize all his ideas and reactions in accordance with the prevailing conventions of his group.

Turning to methods directed towards combating a state of affairs which he considers modern conditions to be aggravating, he lays stress on the importance of developing "first the capacity to think, then a few quiet places in which to think, and finally some worth-while things to think about—this would constitute the prescription of mental hygiene." He proceeds to develop his argument as follows. A strongly extroverted environment is not particularly good, even for the extrovert. It provides too many broad, brilliantly lighted, and noisy avenues along which energy may be uselessly expended, and far too few quiet shaded retreats in which meditative thought may come to a fruitful maturity. Joad reflects: "To step on foot-throttles, insert coins into metal slots, scan headlines, crowd through clicking turnstiles, turn on the radio, hurl ourselves over the surface of the earth in a mechanism propelled by petrol—these constitute the modern notion of entertainment." As for the introvert, an extroverted society will have little or none of him. Unless he is fortunate enough to find a niche in which he may think, he is very likely to be bruised by encounters with a social stratum which, though friendly and genial on the surface, underneath is quite hard and unyielding to nonconformists.

In the present state of the world it is perhaps inevitable that the author's destructive criticism is more forcible than his constructive planning for mental hygiene. Nevertheless this book, based on his Salmon Memorial Lecture, provides reading which is not only sardonically entertaining but also salutary.

STRUCTURE OF THE RETINA

Rétine Humaine et Phénomènes Entoptiques. By Dr. E. P. Fortin. (Pp. 207; 124 figures; 3 coloured plates. 250 francos.) Buenos Aires: E. P. Fortin.

Dr. E. P. Fortin's book on the human retina and entoptic phenomena summarizes many years of specialized study, the author having been particularly prominent in the investigation of entoptic appearances. The present monograph is a challenging essay, for if its conclusions are accepted it involves little less than a completely new anatomy and physiology of the retina. Fortin advances strong criticism of Cajal's methods of studying the retina and his conception of retinal structure, stressing in particular the points that Cajal's studies are based largely upon non-human eyes and that his methods are open to the possibility of numerous artifact appearances. This criticism is supported by many untouched photomicrographs, some of them in colour.

Fortin holds that the neuro-epithelium at the fovea is not hexagonal but round, the hexagonal figures seen under the microscope being artifacts due to shrinkage. The rods and cones, he holds, are equally long, and the foveal elements are neither the one nor the other, but a specific structure intermediate in character between the two. He also disputes that the external limiting membrane has the structure generally ascribed to it, and holds that it has no connexion with Müller's fibres, which indeed he regards as artifacts. Even more thoroughgoing is his view of Henle's fibre layer, which he holds to be not fibrous, but to represent fine canaliculi carrying a fluid permeating the whole retina. The attachment of the external limiting membrane to the ora is held to induce changes of form at the fovea with a consequent "accommodation" localized here. Fortin suggests that a new layer described by him as "campanules" associated with Henle's fibres are the recipient elements of the retina. He elaborates a theory of vision based upon the disproportion in size of the red blood corpuscles and the finest of capillaries, the friction induced setting up something like electrical currents. Entoptic phenomena are analysed in the light of these views on the structure and function of the retina and are held to give corroborative evidence.

How far the author's views are valid is difficult to decide. His own factual evidence is not inconsiderable. It is, therefore, all the more regrettable that his criticisms of the existing teaching are in tendentious language.

ANATOMICAL RELATIONSHIPS

A Method of Anatomy: Descriptive and Deductive. By J. C. Boileau Grant, M.B., Ch.B. Second edition. (Pp. 794; 651 illustrations. 33s.) London: Baillière, Tindall and Cox. 1940.

A second edition of Boileau Grant's *Method of Anatomy* has now been published. Some important amendments have been made in the text and a large number of illustrations added to those of the first edition, which appeared in 1937. One of the principal aims of the work, as stated by the author, has been to assist the study of anatomy by correlating certain developmental and mechanical factors, with the object of explaining the mutual relations of various organs and parts which are present in the adult. The new matter introduced into the text is chiefly concerned with a short description of special systems, and is a sketch of the outstanding structural features of these systems and organs illustrated by schematic diagrams and brief allusions to their general function. Some of the new illustrations deserve special mention—namely, those which are stated to have been drawn or prepared from tracings of photographs of original dissections made for a definite purpose, such as the exposure of the kidneys from behind.

These bear the stamp of originality and differ much from others, which lack the essential attributes of correct outline, perspective, proper representation of texture, and skilful shading. The book as a whole contains a large amount of practical information and should prove a valuable help to dissectors in the study of anatomical relationship. The author has, however, limited the scope of his work in certain important directions, and the reader will have to seek elsewhere for a description of the anatomy of the brain, or any consecutive description of the various stages of the development of the organs, or any adequately illustrated or complete account of the minute structure of the tissues or organs described in the text.

SEX ENDOCRINOLOGY

Endocrine Gynecology. By E. C. Hamblen, B.S., M.D., F.A.C.S., Associate Professor of Obstetrics and Gynecology, Duke University School of Medicine, North Carolina; with a foreword by Prof. J. B. Collip, M.D., McGill University, Montreal. (Pp. 453; 169 figures, 4 colour plates. 30s. net.) London: Baillière, Tindall and Cox. 1939.

Sex endocrinology is a subject which has proved fascinating to the chemist, the physiologist, the experimental pathologist, and the clinician. New discoveries give promise of still greater advances in the future, and many clinical problems hitherto unexplained are now being attacked from an endocrinological background. At the present stage of progress undue optimism is as much to be avoided as unwarranted pessimism, and without an impartial analysis of the accumulating mass of conflicting data it is easy to err in either direction. Further difficulties arise for the clinician endeavouring to assess the true value of hormone therapy when he remembers that the same basic treatment may produce a varying response in individuals of different species and to a lesser degree in different individuals of the same species.

A careful and conservative account of sex endocrinology with an interpretation of the established facts of relevant physiological research is presented by Dr. Hamblen in his book *Endocrine Gynecology*. The author modestly states that the gynaecologist will discover little that is new in these pages, but expresses the hope that the general practitioner will find the volume useful. The statement is, however, a little misleading, for even the specialist who is thoroughly conversant with the subject will find the book very helpful for reference purposes and the bibliography of particular value, while the general practitioner would be pardoned if he were disappointed with the volume. He would probably read somewhat hastily the first two divisions, dealing with introductory considerations and physiology, much of which is of mainly academic interest, and devote most of his attention to the pathological section, in which he would hope to find the answer to so many of his everyday problems, such as the treatment of dysmenorrhoea and menorrhagia and the investigation and treatment of sterility. He would find that the section is not arranged so as to be of much assistance to the practitioner. All the information he requires is there, but he would probably be more confused than helped as he searched for it. For example, he would find that in the treatment of dysmenorrhoea progesterone has been disappointing, but that in seventeen selected patients ten were benefited, although he is given no indication of what method of selection was used. Admittedly the original paper can be traced without difficulty from the list of references at the end of the section, but the average practitioner would have neither the time nor the facilities to conduct such a search. This failure to give a critical analysis of the data presented is a major defect. It is the more to be regretted in that the average reader will find guidance essential if he is to derive much practical benefit from the book. He may be compared to the traveller in our wartime countryside, who by a few well-placed signposts would have annoyance and tedium changed into pleasure.

Notes on Books

Sir ROBERT HUTCHISON'S well-known *Lectures on Diseases of Children* were originally delivered at the London Hospital and published serially in the *Clinical Journal*, and first appeared in book form in 1904; the seventh edition came out in 1936. A life of thirty-four years for a single-handed work is somewhat unusual, and now the President of the Royal College of Physicians has handed over to Dr. Alan Moncrieff the complete responsibility for the eighth edition (Edward Arnold, 21s.). With a leeway of at least four years there is naturally a good deal of new work. Several chapters, on infant feeding and the premature infant, are entirely new, and numerous additions have been made, so that the whole volume has been reset. The illustrations, of which nearly forty, original or substituted for older ones, are new in this edition, are admirably reproduced; the one of the "syphilitic wig" is retained with the warning: "You must not, however, suppose that every child like this is syphilitic; there are some nationalities, and perhaps families, which show a tendency to the same sort of hair without having congenital syphilis."

Dr. ALAN MONCRIEFF'S small volume *Infant Feeding* (Edward Arnold, 1s. 6d.) is a clear and practical account, based on much experience, by the reviser of Sir Robert Hutchison's *Lectures on Diseases of Children*, and published simultaneously by the same firm, mainly in response to requests by the audiences of recent lectures by Dr. Moncrieff for the material at a small cost. This is a gracious act on the part of the publishers, who might be anxious about the effect on the sale of the complete work, and will be appreciated by medical students, nurses, and midwives. Though not a common departure from custom it is far from unique—for example, the 100-page article on inflammation by J. G. Adami in Allbutt's *System of Medicine* (1905) was published separately. The prevailing note is one of simplification and adaptation of the new knowledge of nutrition to the requirements of infants as individuals, and not as machines responding with mathematical accuracy to man-devised rules.

A recent edition of the excellent little guide, *Fractures and Dislocations for Practitioners*, by EDWIN O. GECKELER, brings it up to date, while additional illustrations also add to its value. To harmonize with the times more space has appropriately been devoted to the treatment of compound fractures and to the applications of skeletal traction. The author contends that the practitioner to-day should be able to deal with wounds and to insert Steinmann's pins or Kirschner wires as emergency operations; in other respects the early treatment of fractures at his hands should be essentially conservative. Few will dispute this. Plaster technique is explained in detail, and this little book should be ready to hand, on the desk or in the library of every busy practitioner. Of convenient size and attractive appearance, it is not only a sound guide to management but will also save the relatively inexperienced from many pitfalls. The publishers in this country are Baillière, Tindall and Cox, and the price is 22s.

Preparations and Appliances

CARBACHOL

"Carbachol" (Evans) is a preparation of the carbamylcholine marketed by Evans Sons Lescher and Webb Ltd. The drug is put up in 2-mg. tablets for administration by mouth, and in ampoules for injection which contain 0.25 mg. This drug has been found of value for prevention of post-operative distension of the abdomen, and for provoking contraction of the bladder in cases of retention of urine due to functional causes. It also is of value in the treatment of paroxysmal tachycardia.

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HEPATIC AND RENAL LESIONS AFTER SEVERE BURNS

The demonstration of morphological damage in many organs and tissues after burns with an early or late fatal issue seems to have been made only in recent times. The changes in the liver and kidneys have been presented by Zinck[1] in an attempt to obtain a clearer pathological background for clinical findings. Brenner has described a serous hepatitis in a child who died some time after incurring slight burns; Eppinger concluded from his experiments that a serous inflammation arose after burns; and Fraenkel occasionally observed karyolysis and the appearance of a golden-yellow pigment round the nuclei of liver cells. Fatty changes in the liver have also been described, but some workers hold that no special hepatic changes occur as a result of burns. On the clinical side, however, there are grounds for supposing that burns do lead to hepatic and renal disturbances: thus, slight increases in blood urea, large increases in non-protein and in residual N (that is, N.P.N. – urea N), and increased excretion of amino-acids and lower polypeptides have all been reported, and so have albuminuria and peptonuria. The cause of these changes is commonly held to be the liberation from the burnt tissue of toxic protein degradation products. The frequently occurring oliguria and anuria are held by Pfeiffer to be due to splanchnic paralysis. Porges showed that in hypochloraemia (and hence in severe burns also) there is a diminished renal excretion of toxic products. Further, after burns there are hyperglycaemia and a rapid loss of glycogen from liver and muscles. Blood cholesterol also rises, but the alkali reserve falls. According to Nonnenbruch the increase of residual nitrogen in the blood is a clear indication of damage to the liver. He found it in cases treated with salvarsan, in the course of hepatic cirrhosis, and in acute yellow atrophy of liver. An increased residual nitrogen in the blood must not, according to Nonnenbruch, be regarded as necessarily an index of renal insufficiency; it may be associated with so great a defect in liver function that urea formation fails altogether. In this country and in Germany non-protein nitrogen in the blood is usually determined without estimating urea and hence the residual nitrogen. In the cases recorded by Zinck it is therefore impossible to say what the values for residual nitrogen were. As to the effects of burns on the kidneys, such evidence as there is seems to indicate that something like a nephrosis results.

The cases described by Zinck are of much interest. In two, in which very extensive areas of the body were covered with first to fourth degree burns, death took place after seven hours and after fourteen hours. At necropsy the liver was found to be flaccid and somewhat friable, but showed no wrinkling of the capsule. Microscopically there were some central dissociation with many multinuclear cells, a high degree of acute brown atrophy, with oedema and peripheral cloudy swelling. Considerable histiolymphocytic infiltration and swelling of the Kupffer cells were observed. The walls of the capillaries and especially of the central veins were swollen, and in the latter vacuolated. Congestion was not severe. Near the liver margin were many areas resembling infarcts and also coagulation necrosis. In the kidneys there were a high degree of cloudy swelling and droplets of hyaline material. In the case of a healthy woman of 57 who had died three and a quarter days after extensive scalds the temperature rose after forty-eight hours and coma set in on the third day: infusion of glucose was of no avail; non-protein nitrogen was 150 mg. per 100 c.cm.; direct van den Bergh was negative; there was no albuminuria or glycosuria; she died in coma on the fourth day. Post mortem the liver showed extensive necrosis of central and intermediate lobules with vacuolated degeneration and multinuclear necrotic cells, peripheral cloudy swelling, and extensive oedema. The liver cells contained stored protein; the Kupffer cells were swollen. There were extensive necroses and isolated areas of calcification in the kidneys; many casts were found. There were definite glomerular changes, haemorrhages, and marked cortical and medullary oedema. In another patient, who died twenty-six days after scalds, fever was followed by return to normal temperature, and vomiting then set in. The pulse, at first 80 to 96, gradually fell in the latter days to 64 and 35, and was irregular. There was oliguria. The scalded area healed quite well, but death occurred with signs of heart-block. Macroscopically the liver showed a high degree of "red atrophy" and was fragile; microscopically there was advanced serous hepatitis with widespread fibrinous and homogeneous exudates of plasma. The parenchymatous cell nuclei were pyknotic, and all stages varying from apparent erosion to complete disappearance were observed. Kupffer cells were absent from extensive areas and, when present, were swollen, vacuolated, fatty, and often calcified. In the kidneys there was extensive serous inflammation with interstitial sclerosis, pronounced "glomerulo-nephrosis" with mild fatty changes and some epithelial regeneration, and acute histolysis of the glomeruli and histiolymphocytic infiltration. Calcifications were less marked than in cases of early death; otherwise the changes in the kidneys in this late case were the same as in the cases where death came in the early stage. In all these and other cases the liver, in spite of oedema and congestion, was much below the normal weight. In cases of early death there was acute necrosis, whereas in some of the cases of late death there was rather an insidious form of serous inflammation with exudate slowly eroding and disintegrating the parenchymatous cells. This latter process picks out the central and intermediate zones. It must be emphasized that the condition of the liver in these cases is not necessarily associated with cardiac disturbance.

In explanation of the lobular necrosis of the liver the author considers the state of the capillaries as the decisive factor and that this is brought about by the action of protein degradation products from the burnt tissue. In cases of early death, when the liver shows

[1] *Klin. Wschr.*, 1940, **19**, 78.

dissociation, brown atrophy, and beginning parenchymatous collapse between central veins, and oedema, the appearance of clinical signs of disturbed liver function is to be expected, although, perhaps, not in a very striking degree. The absence of jaundice in such cases is not, as held by some workers, evidence against liver changes; in four of the author's cases yellow discoloration of the sclerae was found some twenty hours after the burn. Cases of early death may fail to show icterus because of the time factor. Clinically and morphologically the effects on the kidney are less impressive than those on the liver, but nephrosis with necrosis and calcification may occur. Urinary findings are often trivial. The loss of chlorine into the tissues, from the burnt area and as a result of vomiting, diminishes the power to excrete toxic degradation products. Where death occurs late there is a picture of "glomerulo-nephrosis," with collapse of the glomerular vessels and abnormal permeability of the capsule; in some cases synechiae are seen between the glomerular loops and capsule. Clinically the kidney condition is reflected in diminished power of excretion and concentration. The occurrence of symptoms of uraemia in some cases after burns is made clear by the pathological findings in the kidney. Haemorrhages into serous membranes and into the duodenum are found in cases showing liver damage, but the latter are not always visible to the naked eye. Haematuria is frequent after severe burns and is not necessarily related to the extent of the burn. Haemolysis has also been described. These haemorrhagic phenomena combined with icterus and sometimes nervous signs (restlessness, tonic-clonic spasms, coma, vomiting) present a "hepato-toxic" picture.

SURGICAL EXPERIENCE IN THE SPANISH WAR

At the present time the treatment of wounds is in the forefront of the minds of a large section of the medical profession, and the principles which guide us in this work are in the main based on the extensive experience gained in the four-years war of 1914–18. This experience was put to a short and sharp test in France early this year and to a less extent on the home front since then. It is true that some fresh impressions have been gathered, but as yet no systematic study is forthcoming of the problems that await solution. In the meanwhile we can still draw on the lessons learnt in the Spanish Civil War, and for that reason welcome the recent account[1] given by Dr. D. W. Jolly of his wide experience as an officer in the Spanish Republican Army Medical Service. He has approached the subject with a mind not unduly trammelled by tradition, and his record may well fill the gap for those seeking guidance till current experience crystallizes out. The first part of his work deals with problems of organization, and is of special interest because it describes the gradual development of a system not handicapped by set ideas and a rigid traditionalism. The importance of the early surgical treatment of certain types of injury was clearly recognized, and the organization directed to satisfy this demand, which ultimately became effective in the Republican Forces, is given the title of the "Three Point System," embodying (1) the Casualty Classification Post; (2) the No. 1 Hospital (where cases requiring immediate surgical operation are dealt with); and (3) the No. 2 Hospital, for the less urgent. It is stated that the time-lag between a man being wounded and his arrival in a No. 1 Hospital was reduced to five hours, and that in the case of a No. 2 Hospital the time-lag was ten hours. No doubt these figures are but approximations. The basic principle underlying this arrangement of forward medical units is, in fact, not very different from that ruling in France in 1918; the function of the classification post was there performed by a main dressing station, and the C.C.S.s allocated for the reception of special groups of cases corresponded to the No. 1 and No. 2 Hospitals. The novelty of the Spanish scheme lay in the composition and equipment of the surgical teams: the surgical team serving the basic hospital units ultimately had a personnel of fourteen, including four medical officers. The team was self-sufficient as to transport and full surgical equipment, and it certainly seems to have been the means whereby first-class surgical assistance was made available in the crucial period. To judge from what Dr. Jolly says, the siting of hospitals seems to have been left largely in the hands of the medical authorities without interference from the general staff. The terrain in Spain appears to have been particularly well furnished with ready-made shelter for hospital units; in contrast it must be recognized that in Flanders and a good many areas in England mined galleries, tunnels, and chalk pits are seldom available. The construction of bomb-proof dressing stations or hospitals in such regions is neither simple nor rapidly effected. Dr. Jolly's account of the Republican system will, no doubt, receive due consideration in any reconstruction of the British Army's medical organization, in which the need for greater elasticity and mobility was very clearly demonstrated during the recent campaign in France.

The problem of surgery in the forward area, which is dealt with comprehensively in what is much the best part of the book, shows the author to be possessed of extensive knowledge and sound surgical judgment. It is interesting to note the conclusions arrived at by the Spanish surgeons in regard to some contentious points. For example, the primary suture of nerve injuries was frowned on and the results of secondary suture were found to be satisfactory. In the treatment of fractures there is a strong bias in favour of the use of plaster-of-Paris for all cases. It is interesting to note that in the forward area plaster casings made from shaped flannel wrung out in emulsion were favoured; this was the method introduced by Mr. John Croft at the end of the last century. The Thomas splint, even for first-aid work, receives surprisingly little notice; so little, indeed, that one wonders whether the provision of this useful piece of field apparatus was mismanaged. The recommendations in regard to the treatment of fractures, except in case of those of the femur, conform to what was the general practice in the B.E.F. in 1939–40. Dr. Jolly's clear directions on the surgery of wounds of the chest and abdomen, based on extensive experience, cannot but be helpful to the Army surgeon.

[1] *Field Surgery in Total War*. By Douglas W. Jolly, M.B., Ch.B. N.Z., late Major, Spanish Republican Army Medical Service. With a foreword by Surgeon Rear-Admiral G. Gordon-Taylor, F.R.C.S. Hamish Hamilton Medical Books. 1940. (10s. 6d.)

We notice that thoracotomy and not aspiration is recommended in the treatment of pressure or valvular pneumothorax. No mention is made of the use of a colostomy in the treatment of wounds of the large bowel. Drugs of the sulphonamide group were not systematically investigated in the Spanish War, and consequently Dr. Jolly expresses no opinion on their value. Full and, if possible, controlled observations on the prophylactic and therapeutic efficacy of these drugs in the treatment of wounds will be a major contribution to the surgery of both war and peace. A notable omission is any reference to burns and their treatment, and yet they form a not unimportant group of casualties in modern warfare.

PREGNANDIOL

The need for a reliable test of corpus luteum function has stimulated workers in this field ever since the discovery of progesterone, the active principle of the corpus luteum. Attempts to identify progesterone in the tissues and fluids of the human female have, however, failed. In 1929 a substance—pregnandiol—was isolated by Marrian[1] from the urine of pregnant women; this finding was confirmed by Dingemanse and co-workers[2] and also by Butenandt.[3] The latter and his co-workers[4,5] established a structural formula and succeeded in 1934 in converting pregnandiol back to progesterone. In 1936 Venning and Browne[6] demonstrated that pregnandiol was excreted in the urine as a complex with glucuronic acid, and sodium pregnandiol glucuronide could be extracted quantitatively from the urine of pregnant women; later, they showed that it is also excreted during the progestational phase of the menstrual cycle. Venning and Browne[6,7] after further work concluded that this compound was an altered product of progesterone, and their observation has since been confirmed and elaborated. It has been shown that from 3 to 60 mg. of pregnandiol are excreted in the urine during the progestational phase of the menstrual cycle, and the excretion usually disappears a few days before the onset of menstruation. There does not appear to be any correlation between the degree of change in endometrium and the amount of pregnandiol excreted; if pregnancy happens the excretion of pregnandiol, which began in the progestational phase, continues and rises steadily throughout pregnancy to reach a maximum in the eighth and ninth months, and ceases a few days after delivery. During pregnancy there is also a considerable range in the total amount excreted a day; Venning[9] gives a mean figure in the last few weeks of pregnancy of 75 mg., but there appears to be a range of normality from 30 to 120 mg. Apart from these physiological conditions no other is known in which this substance is excreted. By the administration of progesterone, however, an artificial excretion can be produced. As this will occur in both males and females it is apparent that, contrary to earlier ideas, the endometrium is not essential for the conversion of this substance into pregnandiol.[10] It is now generally assumed that the liver is the site of this alteration. It is known that when the kidney is damaged sodium pregnandiol glucuronide is not excreted; hepatic or renal disease must therefore be excluded before any trustworthy estimation of the excretion of pregnandiol can be obtained. Although it is generally accepted that the pregnandiol is a specific excretion product of progesterone Cuyler, Ashley, and Hamblem[11,12] record that it is also excreted after the administration of desoxycorticosterone to the male.

At first it was thought that a quantitative estimation of excretion of pregnandiol during the menstrual cycle might constitute a test of corpus luteum function. Attempts to establish normality have, however, revealed such a wide range in total excretion that quantitative differences do not appear to have any pathological significance. In the absence of complicating factors such as renal disease, a complete absence of pregnandiol would suggest the absence of ovulation and production of progesterone. Some authors disagree with this, and Hamblem, Ashley, and Baptist[13] believe that a failure of excretion is not conclusive evidence of inadequate ovarian function. This point needs elucidating. As the presence of an ovum in the interstices of a corpus luteum has been observed in monkeys it is possible that this might happen in the human being; also, a secretory endometrium might arise and pregnandiol be excreted although ovulation might not have taken place. Clearly, then, it is possible that even if pregnandiol is present there may have been no ovulation, but it would be highly probable, and in most cases the absence of pregnandiol would point to a failure of ovulation. Buxton[14] showed that in most patients who were excreting this substance the endometrium was of secretory type. In a few, however, the correlation is not complete, as has been pointed out by Wilson, Randall, and Osterberg.[15] Bartelmez many years ago observed that different parts of the uterine mucosa respond differently, and portions of endometrium from the same uterus may often differ in their character considerably. We can, therefore, only assume at the moment that as a rule the excretion of pregnandiol is correlated with a secretory endometrium. During pregnancy quantitative variations in the excretion of pregnandiol are impossible to interpret in terms of pathology. Cope in our present issue (p. 545) states that its complete absence is always evidence of serious abnormality, and in early pregnancy it suggests that abortion will occur, and in late pregnancy the death of the foetus. But it is not a reliable test—at all events in late pregnancy, as in only a small percentage of cases of foetal death can the absence of pregnandiol be demonstrated, and in others excretion is normal. Such a test can only be used as an adjuvant to other methods of investigation. The significance of a low pregnandiol excretion, if indeed there be any significance, is still undetermined. Unfortunately, too, a normal excretion of pregnandiol is no proof that the pregnancy is normal. And artificial disturbances of the excretion during pregnancy may arise in connexion with either toxaemia or chronic nephritis, which would render any estimations valueless. It has been suggested that the estimation of pregnandiol might be used as a test for pregnancy, and it is assumed that the associa-

[1] *Biochem. J.*, 1929, **23**, 1090.
[2] *Dtsch. med. Wschr.*, 1930, **56**, 301.
[3] *Ber. dtsch. chem. Ges.*, 1930, **63**, 659.
[4] Ibid., 1931, **64**, 2529.
[5] Ibid., 1934, **67**, 1901.
[6] *Proc. Soc. exp. Biol.*, N.Y., 1936, **34**, 792.
[7] *Endocrinology*, 1937, **21**, 711.
[8] *Amer. J. Physiol.*, 1938, **123**, 209.
[9] *J. biol. Chem.*, 1938, **126**, 595.
[10] *Proc. Soc. exp. Biol.*, N.Y., 1939, **41**, 284.
[11] *Endocrinology*, 1940, **27**, 172.
[12] Ibid., 177.
[13] Ibid., 1939, **24**, 1.
[14] *Amer. J. Obstet. Gynec.*, 1940, **40**, 202.
[15] Ibid., 1939, **37**, 59.

tion of amenorrhoea with excretion of pregnandiol in the urine can only occur with pregnancy. Although this may be true, the test will be of little value in the first few weeks of pregnancy as the total excretion a day during that time is relatively small and can be confused with a delayed progestational phase; it is unlikely that this estimation—at all events in its present form—will be as valuable as the Aschheim-Zondek or Friedman test.

It is particularly unfortunate that during this period, when an effort obviously has to be made to establish normality, many authors are not careful enough in the identification of their final product, which in many cases is assumed to be pregnandiol on very slender evidence.

CEREBRAL CIRCULATION IN SLEEP AND HYPNOSIS

Since Mosso's classical observations that during sleep there is an increase in the volume of blood in the extremities and a decrease in the supply to the brain, many authors have studied the cerebral circulation during sleep, and various theories have been based on cerebral hyperaemia or anaemia according to the author's findings. Gibbs,[1] who measured the blood flow from the brain by a thermo-needle in the internal jugular vein, found no difference in circulation between the waking and sleeping states. Nygard,[2] in observations on five young patients who had trephine openings in their skulls, found that there was a gradual and rhythmical increase in the volume of the cranial contents during sleep, until a maximum was reached, and that this maximum was sustained at a fairly constant level so long as deep sleep lasted. With the onset of sleep the amplitude of the cerebral pulsation increased markedly, and the dicrotic wave became elevated and much more prominent. When the patient was wakened the volume curve descended to normal. These changes in the cerebral circulation are more likely to be the result of sleep rather than the cause of it. The findings support the views of those authors who do not believe in the circulatory sleep period. More interesting are Nygard's observations that during deep somnambulistic sleep, which he succeeded in inducing in two of his subjects, there were no changes in the circulation, and the pulse was indistinguishable in amplitude, form, and volume from the pulse of the waking period. In other words, the physiological mechanism of sleep and of hypnosis differ so far as the cerebral circulation is concerned.

MALARIA IN DRUG ADDICTS

The possibility of transmitting bacterial infections by means of insufficiently sterilized syringes has been emphasized in recent years by the tragic accidental infection of children with tuberculosis in the course of diphtheria immunization. That protozoal diseases, more especially malaria, may also be accidentally transmitted by dirty syringes is perhaps less commonly known. Biggam[3] in 1929 was the first to record an epidemic of malaria among drug addicts in Cairo, and an epidemic of cerebral malaria was observed in Dublin during the last war in a number of men who became acutely ill after receiving an injection of neoarsphenamine (MacArthur[4]). Although each man had had a fresh needle the same rubber tubing had been used for all, and a soldier who received his injection immediately before the first man to be taken ill was found to be an ambulatory case of infection with *Plasmodium falciparum*. In America the accidental transmission of malaria among drug addicts has become a problem of some magnitude. The first case in the United States was recorded by Geiger[5] in 1932, and two years later Helpern[6] recorded an epidemic of malaria among drug addicts in New York City. Of forty-nine cases all caused by the use of hypodermic syringes in common, twenty-one were fatal. Most[7 8] now states in two journals—in communications which are practically identical word for word—that more than 200 cases of malignant malaria have been diagnosed in New York since 1934; half the cases were fatal. This sudden increase in malaria in a city where the disease is not naturally endemic is almost entirely due to the intravenous injection of heroin and to the fact that the communal use of the drug at the same time by groups of addicts has now greatly increased. Dried blood containing plasmodia rapidly ceases to be infective. With the exception of one case due to *Plasmodium vivax* and one to *P. malariae* all those in Most's series were caused by *P. falciparum*. Clinically and pathologically the disease in drug addicts manifested all the characteristics of malignant malaria as seen in the true Tropics, including cerebral and intestinal manifestations as well as symptoms of blackwater fever. Females of *Anopheles quadrimaculatus*, a species which breeds freely in New York City and its immediate environs, could be easily infected by feeding on persons who had acquired malaria as a result of drug addiction. These facts constitute a serious menace in the form of an epidemic of malignant tertian malaria among the healthy population of New York.

IRIDOCYCLITIS AND TUBERCULOSIS

Now that it is recognized that mild disease processes may occur in tuberculosis when the balance between allergy and immunity is not clearly tipped on to the side of hypersensitiveness as against immunity, fresh interpretations are being made of various chronic eye diseases in which a tuberculous factor is suspected. The view that phlyctenular ophthalmia is a manifestation of tuberculous allergy has gained a readier acceptance, and an increasing number of lesions are being brought within this new survey. Uveoparotid fever, which is now recognized as part of the syndrome of sarcoidosis, is regarded by many competent authorities as an abortive form of tuberculosis ending sometimes in a frank generalized outbreak of the disease. A problem of interest is the possible tuberculous nature of chronic iridocyclitis. That a tuberculous iridocyclitis exists, and that iridocyclitis is seen in many syndromes now suspected to be of tuberculous origin, make it possible that the usual type of slowly progressive iridocyclitis may be yet another abortive manifestation of tuberculosis. To this problem a useful contribution has been made by Brooks, Juler, and Williams.[9] In a series of forty cases of chronic iridocyclitis they found radiological and clinical evidence suggestive of tuberculosis in no fewer than twenty-five patients. Frank tuberculosis as shown by bacilli in the sputum was present in only three patients, but the incidence of suggestive lesions in the chest and elsewhere is certainly far higher than a statistical computation for the general population would show. A point of interest that they bring out is the relative insensitivity of the Mantoux test in cases in which the evidence for tuberculosis was definite. This agrees with the findings of other observers and emphasizes the fact that skin sensitivity to tuberculin is not such a conclusive criterion of the nature of localized lesions as was once believed.

[1] *Brain*, 1935, **58**, 44.
[2] *J. exper. Psychol.*, 1939, **24**, 1.
[3] *Trans. roy. Soc. trop. Med. Hyg.*, 1929, **23**, 147.
[4] Quoted by C. M. Wenyon, *Protozoology*, **2**, 955. 1926, London.
[5] *J. Amer. med. Ass.*, 1932, **98**, 1494.
[6] *Amer. J. Surg.*, 1934, **26**, 111.
[7] *Trans. roy. Soc. trop. Med. Hyg.*, 1940, **34**, 139.
[8] *Amer. J. trop. Med.*, 1940, **20**, 551.
[9] *Brit. J. Ophthal.*, 1940, **24**, 317.

THE PHYSIOLOGY OF CONCUSSION

Despite recorded observations of minute changes in the brain, such as petechial haemorrhages, ependymal tears, extravasations of cerebrospinal fluid, etc., as constituting the pathology of concussion, there has been no unanimity of opinion on these changes, and it is true to say that there is no recognized pathology of this condition. This is borne out by some work by W. W. Scott,[1] of Chicago, in which the brains of the animals subjected to experimental concussion were carefully examined at the end of the experiments; no demonstrable changes were observed and the cerebrospinal fluid remained clear. The clinical features of concussion—namely, a transitory period of unconsciousness, instantaneous in onset, and due to a head injury from which there is complete recovery—were produced when a blow sufficient to cause the intracranial pressure to rise above the systolic blood pressure was delivered to the skull. There was no loss of consciousness if the blow did not raise the intracranial pressure above the systolic blood pressure. The periods of unconsciousness varied from two to five minutes, and some of the animals had momentary rigidity of the legs, back, and tail, resembling the condition occasionally seen when a footballer is "knocked out" or a prize-fighter receives a "knock-out" blow. The author concludes that a blow to the head severe enough to cause a brief period of unconsciousness but not intracranial haemorrhage or other pathological change detectable with the naked eye is invariably associated with a rise in the intracranial pressure much above the existing systolic blood pressure, thus causing cerebral anaemia. Brief periods of anaemia are of much greater consequence to the cerebral cortex than to other tissues because of its high respiratory rate and extreme susceptibility to oxygen lack. The clinical evidence of cortical anoxaemia is the state of unconsciousness we know as concussion. The view of the nature of concussion long held by Wilfred Trotter has been substantiated experimentally.

VENEREAL DISEASE IN NAVAL FORCES

For various reasons naval personnel are especially exposed to the risk of infection by venereal disease. The authorities of every navy recognize this danger and employ special means of guarding against it. In some navies prophylaxis is voluntary, in others compulsory. Dr. Heinz Neumann, one of the naval medical staff at Kiel, says in an interesting comparative survey[2] that current methods of chemical prophylaxis all follow much the same lines. An intra-urethral injection of silver nitrate is followed by the external application of a mercury ointment. In addition, carbolic acid or some other disinfectant is used against the Ducrey bacillus. The value of this method naturally decreases as the interval between exposure and treatment grows longer, and its efficacy depends on its proper use. On the average, Dr. Neumann says, it should only fail about once in ninety cases, whereas without it the risk of infection is more than one in thirty. Authorities are unanimous that the only really efficient protection is given by the condom, and that when this is used with chemical prophylaxis the risk is practically annihilated. All navies arrange for instruction of personnel in the facts of venereal disease, the improvement of facilities for the employment of shore leave in a legitimate way, and co-operation with the civil authorities. The American service has found that better instruction and prophylaxis have resulted in a notable decrease in the incidence of venereal disease. Our experience in this country shows the uselessness of negative legislation; by the Contagious Diseases Act, 1864, we imposed compulsory supervision and treatment of infected persons, but in the long run this Act did not reduce the incidence of these diseases, and it was repealed. We made another attempt during the last war under the Defence of the Realm Act, and this also was unsuccessful. Alderson's figures[3] show the highest incidence in our Africa and China stations, a considerably smaller incidence in the Mediterranean, and the least at home. The figures have been constantly falling since 1921, except for a rise in 1929. The incidence of gonorrhoea, as abroad, is much higher than that of other venereal diseases. In France the incidence seems on the whole to remain stationary. The Dutch authorities have not found that prophylactic measures have any real value. The Italian navy have, however, according to Clemente,[4] attributed a notable decline in their incidence figures principally to this factor.

[1] *Arch. Neurol. Psychiat.*, Chicago, 1940, **43**, 270.
[2] *Arch. Derm. Syph.*, Vienna, 1939, **179**, 651.

CHAGAS'S DISEASE

In two recent papers Professor Brumpt[5] gives an interesting and lucid account of Chagas's disease, which appears to be much more widely spread in S. America than proven cases would indicate. For example, since 1909, when the disease was first described, fewer than 600 cases have been diagnosed by finding the parasite *Trypanosoma cruzi*, yet Professor Talice of Montevideo estimated in 1938 that there must be annually between 4,000 and 5,000 acute infections in which the diagnosis is easy. Brumpt believes that the majority of acute cases rapidly recover, but some develop a chronic myocardial form of the disease. He suggests that this may be the outcome of infection with certain strains of the trypanosome or in patients already suffering from damage to the heart, but such an assumption may be unnecessary in view of the parasite's predilection for the myocardium, as shown by experimental infections in animals. How often this infection damages the heart in man is not yet clear, but it is significant that unexplained forms of heart disease and sudden death in persons relatively young are common in areas where the risk of contracting Chagas's disease exists. Unfortunately the parasites are rarely seen in the blood in chronic infections in man, and diagnosis is extremely difficult. Animal inoculation may help, but Brumpt favours his method of "xenodiagnosis." In this method various species of clean, laboratory-bred Reduviid bugs, the natural vector of the disease, are allowed to feed on the suspected patient, and after fifteen to fifty days at 25° C. are dissected and examined for parasites. Multiplication of any ingested trypanosomes makes the diagnosis easy, and, with the use of numerous bugs, the sensitivity of the method is high because each bug, according to its age, ingests from 10 to 500 times as much blood as can be examined on a slide. Another help is the Machado reaction, a complement deviation test in which extracts of tissues from puppies infected with *T. cruzi* or cultures of the parasite are used as antigen. The application of these diagnostic methods may throw new light on the distribution of human infections. So far they have only been demonstrated in certain areas of South America, Panama, and Mexico, although the distribution of the infection in the bug and in various animal reservoirs is much wider, and infected bugs have been recently found in Arizona, California, and Texas. A parasite indistinguishable from *T. cruzi* has been found in monkeys from Malaya and Java, but no human infection has ever been recorded from Asia. Treatment of

[3] *J. State Med.*, 1926, **34**, 525.
[4] *Ann. Med. nav. colon.*, 1939, **45**, 111.
[5] *Presse méd.*, 1939, **47**, 1013, 1081.

the disease is unsatisfactory and prophylaxis difficult, but in view of the possible relation between the infection and chronic disease of the heart the importance of the disease is obvious.

SIR JOSHUA REYNOLDS'S EYE AFFECTION

The service that Sir Joshua Reynolds rendered to medical iconography by his portrait of John Hunter was largely repaid by Hunter in the post-mortem examination of Reynolds which he carried out with Everard Home and Sir George Baker. The report of this examination and the scanty medical history of the foremost painter of his age constitute the basis of an interesting study of Reynolds's blindness and death by Burton Chance,[1] which was briefly noticed in our "Nova et Vetera" column on May 25 last. In addition to the characteristic pitting of the face from small-pox, which he contracted early in life, Reynolds had a more serious scar where part of his upper lip had had to be cut away after a riding accident. Later on he was troubled by deafness and had to use an ear trumpet, though this did not interfere with his social activities, for the gatherings at his house were an epitome of London society until the end of his life. At the age of 41 he was known to have been "seriously ill," and seventeen years later he had a "paralytic affection." When he was 66, though he looked healthy and apparently felt so, his work suddenly came to a complete standstill, his previous heavy bookings being largely unfulfilled. He had developed a painful affection of the left eye, and he was afraid to work for fear of endangering the right eye. His social activities continued, but he himself became sad. His medical attendants diagnosed melancholy and ascribed his loss of appetite to this. Their assurances that the right eye would not suffer did not seem to carry much conviction, for there is a note of his dated two years later in which he said: "But I have but one eye now—and scarcely that." What little work he did from July, 1789, when the affection first began, came to an end by November, 1791, and he died peacefully on February 23, 1792. That the fear of blindness haunted Reynolds is apparent from some words in the preamble to his will of November 5, 1791, to the effect that "it is probable that I may shortly be deprived of sight." By then the left eye was "swollen and appeared as though extravasated blood protruded from it." In the following January, when he was compelled to take to his bed, an examination revealed that the abdominal viscera were affected. Post-mortem examination showed a liver double the normal size, weighing 11 lb. and of "a consistence which is usually called scirrhous"; the optic nerve on the right side was shrunken and soft. Burton Chance concludes from these findings that the painful affection of the left eye was a melanotic sarcoma and that the liver enlargement was due to secondary deposits. Though a case can be made out for this retrospective reading of Reynolds's terminal affection, there are difficulties in accepting it. Almost three years elapsed between the time when the eye became painful and Reynolds's death; this is an unusually long period for an untreated melanotic sarcoma. In the post-mortem report the enlarged liver is described as "pale yellow"—not very suggestive of melanotic deposits, though of course the deposits might have been non-pigmented. The finding of a soft optic nerve on the right side (with no mention whatever of the state of the left eye) is puzzling. Reynolds's repeatedly expressed fear that his right eye was affected gains significance in the light of the post-mortem report, and it is questionable whether his affection was indeed unilateral, as his medical adviser believed and Burton Chance accepts. The description of the left eye as "though extravasated blood protruded from it" does suggest a fungating tumour, but it might also apply to an irritable chronic glaucomatous eye during a subacute attack. At the time of Sir Joshua Reynolds's death metastatic deposits in the liver were not recognized, yet melanotic lesions would hardly have been overlooked. His liver affection might well have been due to cirrhosis, a condition that could not have been uncommon among the *bon viveurs* of the eighteenth century. The diagnosis of melanotic sarcoma, though plausible, must therefore be regarded as unproven.

[1] *Ann. med. Hist.*, 1939, **1**, 487.

TUBERCULOSIS IN YOUNG WOMEN

We have previously[1] commented on the attempt by Hart and Wright[2] to find among social conditions an explanation of the unfavourable mortality from tuberculosis in England and Wales for young women since 1900–4 and for young men since 1912–14. Wolff[3] points out that a slowing of the decline in tuberculosis mortality among young adults, especially young women, was observed after the war of 1914–18 in many European countries and also in the U.S.A. Internal migration of the population, first studied in relation to this phenomenon in England by Bradford Hill[4] on the supposition that migrants are mainly physically select persons, and considered by Hart and Wright as a possible factor in producing local differences, cannot, according to Wolff, play more than a minor part for a country as a whole. In the U.S.A. the following percentage mortalities were recorded, the tuberculosis mortality in 1900 being reckoned as 100:

	1910		1920		1930	
	Male	Female	Male	Female	Male	Female
All ages	91	78	60	55	38	31
5–9	94	100	72	64	38	28
10–14	92	84	67	61	38	27
15–19	90	75	64	74	30	38
20–24	76	77	55	67	31	39
25–29	77	70	53	53	31	32
30–34	88	74	55	49	32	29
35–44	102	79	61	52	38	26

In 1910 the percentage fall even in the age group 15 to 29 was greater among females than among males. In 1920, on the other hand, the fall was very much less among females, whereas among the males the fall compared favourably with that in other age groups; this phenomenon was still noticeable in 1930, though not so markedly. Wolff finds a certain correlation between the decline in the birth rate and tuberculosis mortality at all ages as shown for the period between 1906 to 1910 and 1926 to 1930 for fifteen different countries, the coefficient of correlation being as much as 0.52. Hence it seems to be still more probable that a closer relation exists between birth rate and tuberculosis in those persons and at those ages directly concerned in childbirth—that is, in young women. The strikingly higher mortality from tuberculosis found generally among females aged 15 to 29 than among men of the same age and women at higher ages suggests that these specific death rates have a close connexion with maternal activity. Wolff holds it a "natural explanation" that the retardation in the decline in tuberculosis mortality both in England and U.S.A. was caused (*a*) by a transitory rise in the birth rate immediately after the war, and (*b*) by the relatively smaller decrease in first and second births as compared with later births, so that the risk to young women did not diminish in the same degree as that to older women.

[1] *British Medical Journal*, 1939, **2**, 1236.
[2] *Tuberculosis and Social Conditions in England, with Special Reference to Young Adults* (1939). London.
[3] *Amer. J. Hyg.*, 1939, **30**, (Sect. A), 63.
[4] *J. roy. statist. Soc.*, 1936, **99**, 247.

A HOSPITAL'S PRECAUTIONS DURING AIR RAIDS

BY

ROWLAND P. OSBORNE, B.Sc., M.B., F.R.C.S.

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In view of the increase in frequency of air raids not only is the protection of patients and staff in hospitals of the utmost consequence, but the preservation of the efficiency of the latter is of equal importance. In the district around the hospital from which this is written there were thirty-five raids in seven days—the majority after dark and lasting several hours.

Since there have not, to my knowledge, been any suggestions issued in the form of memoranda or circulars from the Ministry concerned, it would appear to be the responsibility of local authorities to devise their own schemes. I have not the slightest doubt that these arrangements are excellent; but the same ideas will not occur to everybody, and it is with the object of stimulating an exchange of views for mutual benefit that I am venturing to record what is being done here.

The Up Patients

An up patient is one who has been accustomed to going unaided to the ward lavatory. Upon receipt of the red warning these patients make their way down the stairs into the cellars. At the bedside of all of them there is a dressing-gown, a pair of slippers, and a blanket, and on reaching the cellars more blankets are at hand. One nurse from the least busy of the wards above the particular cellar accompanies the patients. We have been able to provide camp beds for the children over 12 months old, so that on reaching the cellar they can resume their sleep. They are not disturbed on the "all clear" owing to the almost certain return of the raiders within a short time.

The cellars are warm because of the passage through them of service pipes (see below), are well lighted, and have three alternative exits. They are never crowded during night raids, but during the day cleaners, maids, and visitors swell the number.

Bed Patients

With the receipt of the red warning the nurses place a bed cradle over the head and shoulders of the patient and draw up the heart table to the level of the waist. Over these, and hanging over the head end of the bed, is placed a mattress. The object is to avoid so far as possible injury from flying glass and debris, yet preventing the patient from having any sense of suffocation and allowing the nurse an easy view during her rounds. We find this method can be adopted even when the patient is in Fowler's position, and the great majority are soon asleep if they have, in fact, been awakened by these precautionary measures. We are fortunate in having a reserve of mattresses, but if a ward should be short of them the mattresses of the up patients are used.

The beds are not moved into the centre of the ward, for it is felt that this would expose them to flying debris from two sides. Instead they are left in their usual positions, never directly under a window. The suggestion that patients should be placed under their beds appears at first to be good, but in most general hospitals this would be possible with only a few patients. How can one move a patient after a recent abdominal operation, in a plaster spica, the auricular fibrillations, the pneumonias, the full-term pregnancies, to mention but a few of the commoner cases?

The patients are considerably reassured by the method outlined and, as already indicated, get so accustomed to it that they do not awaken in the night. It is only the new patient and the odd one of excitable nature who needs a little soothing and a few calm words.

Nursing Staff

On receiving the red warning any nurse who is in the nurses' home immediately repairs to her ward; there she helps her colleagues on duty to cover the patients as already described. If the nurse is on any ward other than one for adult male patients and it is 10 p.m. or later, she gets into one of the empty beds and goes to sleep. If she is on an adult male ward she, with any others who find there is not a bed available on their own wards, goes to bed in wards kept empty for the reception of gas-contaminated casualties and ante-natal cases, or in Government huts not yet opened for general use.

At the onset of night raids nurses waited with the hope that the raid would be short, so that they could return to the home, but they soon realized the benefit of ignoring the possibility of a short raid and getting to sleep. They soon became immune to the frightening effect of bombs and anti-aircraft guns, and slept throughout the night. This method ensures, so far as is possible, that they have every opportunity to sleep in a bed and so awaken more rested than after a night sitting or sleeping in a chair or on a form. It also ensures the splitting up of the staff, so that if any part of the hospital sustains a direct hit the casualties will be fewer than would be the case if all the members were gathered together in one department.

If air-raid shelters are to be used they will need to be warm, free from draughts, and provided with bunks, otherwise the staff will after two or three successive nights show a considerable loss of efficiency. If the raid occurs during the day the night staff are not disturbed unless there is any danger in the immediate neighbourhood. If it occurs during meal-times extra sittings are arranged so as to have as little crowding of staff as possible. It has been found to be of great advantage to allow all the staff to come on duty one hour later than usual in the morning. This means an extra hour's work for the night staff and altering the breakfast time for the patients, but the former appreciate that it will soon be their turn to benefit from the extra hour.

Medical Officers

Again the principle is to split up the staff: every doctor has a block of wards allotted to him, and the neighbouring block if his colleague is off duty and away during the raid. His first duty is to assist in covering the patients, then to visit the cellars, which helps to reassure the patients that everyone is co-operating for their benefit. He then finds a bed on his block, reports to the telephone operator of this ward, and goes to sleep. If there is any immediate danger he is at once aroused by the night nurse in response to a telephone call from the superintendent, so that he can proceed to the cellar and there turn off all the service taps. We used to do this at the beginning of the raid, but soon discovered that the cutting off of gas and hot water for several hours interfered too much with the routine work. The reason they are turned off at all is because of the possibility of the pipes fracturing during bombing, with the consequent escape of their contents into the cellars.

"Key Officers"

The superintendent and deputy superintendent take up positions at opposite ends of the hospital, the former sleeping in his office and the latter in a ward. The same applies to the matron and her assistant, whilst the clerk and steward is provided with a camp bed in his office, which is in a block separate from the hospital. All these officials have a telephone at their bedside and all are within a few seconds' reach of a member of the night staff.

Summary

A method of protecting patients during air raids is described.

Efforts to preserve the efficiency of the nursing and medical staff are described.

It is hoped that the article will provoke an exchange of ideas for mutual benefit.

I am indebted to Dr. F. Hall, Medical Officer of Health for the county, for permission to describe our methods, and to the staff of this hospital, the co-operation of every member of which has led to a feeling of calm confidence to deal with anything that is so reassuring.

REMARKS ON POSSIBLE CONSTITUTIONAL FACTORS IN AGRANULOCYTOSIS

The article printed below is a Survey Note prepared for publication by the Bureau of Human Heredity.

In a short report of the Bureau of Human Heredity (115, Gower Street, W.C.1) headed "A Clearing-house for the Study of Constitution" (*Journal*, June 8, 1940, p. 936) it was pointed out that for certain spheres of war medicine particular importance attaches to genetic and constitutional aspects. Among other points the report made it clear that the Bureau deemed it necessary to pay attention to abnormal constitutionally determined reactions to certain drugs—e.g., sulphonamides—of which an increased use is being made in time of war. The same issue contains the description of a case of agranulocytosis following chemotherapy with small dosage by A. W. Spain (1940), who rightly points out that the development of those severe symptoms by no means always depends on the dose of the sulphanilamide or sulphapyridine; even a relatively small dose (in Spain's case 4.5 grammes of sulphapyridine and 4.5 grammes of sulphanilamide) and short treatment (four days) may in certain cases lead to fatal agranulocytosis.

Supporting evidence can be adduced from remarks made by L. Colebrook (1940). From his observation of soldiers Colebrook stresses the fact that total agranulocytosis or, for that matter, partial destruction* of polymorph leucocytes (granulocytopenia) following treatment with sulphonamide is not, after all, a rare occurrence. He goes on to say that generally the onset of these dangerous conditions is closely dependent on the dose administered and the duration of treatment; yet he himself mentions that occasionally *even much smaller doses and shorter periods* than in the recorded cases (where the average was about 50 grammes and twenty days) have led to the outbreak of the disease. His further remark that second and third series are particularly dangerous suggests the possibility of sensitization, provided that the intervals between the series were long enough to rule out the accumulation of toxic substances.

The existence of such cases, following even markedly small doses and very short periods of treatment, draws attention to the possible existence of constitutional idiosyncrasies intolerant of sulphonamide and sulphapyridine. For a toxic effect is unlikely after small doses of sulphonamides: this holds equally for amidopyrine, which, as is well known, may also cause agranulocytosis.

That constitutional factors play a part in the pathogenesis of agranulocytosis was already suggested by Hirschfeld (1922) immediately after the first publication of the syndrome by W. Schultz (1922), and by other authors later. Zadek (1925) on the strength of his own observations took the view that probably "there exists a uniform way of reacting with individual dispositions that, under the influence of some bacteria or toxin, leads to far-reaching damage of the granulocyte apparatus, which is sometimes capable of repair." Later on Reznikoff (1934) voiced unequivocally his conviction that as regards amidopyrine "it is obvious that one is dealing with a question of sensitivity in certain patients rather than with a universal action of the drug." A statement by Prof. L. J. Witts (1936) is of especial interest. He refers to the effect of test doses of amidopyrine on the differential blood count and to other manifestations in patients who had suffered from agranulocytosis. "The white cell count," he says, "falls abruptly within a few hours, and it may be several days before it returns to normal. At the same time the patient may complain of general symptoms such as malaise, sore throat, or pyrexia. *These effects are, of course, not seen in healthy people but only in those who have this unusual susceptibility to amidopyrine.*" Sir William Willcox (1936) voiced a similar opinion in regard to the existence of an abnormal hypersensitivity to amidopyrine and other drugs in certain individuals. The sulphonamides undoubtedly fall into this group of drugs. (An emphatic indication of the danger in cases of *individual hypersensitivity* thereto occurs in the recent War Office memorandum on sulphonamide therapy.)

Such hypersensitivity seems to be related to hereditary factors. L. S. Penrose (1934) says: "There are many records of the transmission of allergic conditions in a manner resembling a Mendelian unit character, usually a simple dominant." E. Hanhart (1934, 1936, 1937a, 1937b) reports careful investigations into the families of 150 pronounced allergics, mainly medical men with a scientific bent. In his detailed study he shows dominant transmission of a hereditary rise in sensitivity level to incompatible substances, which include in addition to proteins some widely used medicines. However, as he further points out, it is not the particular clinical manifestation that is inherited but only the disposition to an idiosyncrasy. The multiplicity of manifestations (polypheny) of the allergic predisposition may withal contrast very strongly with the uniformity of the hereditary factor involved; this, in his own and others' experience, is 100% concordant in the recorded cases of monozygotic twins. Indeed, the wide range of variation in manifestation has hitherto completely masked the underlying common aetiology: no one would at first sight recognize allergic reactions in different organs to a wide range of incompatible reagents, covering great variety of clinical form, as a single constitutional entity save for the final evidence of genetic identity.

It is not here and now possible to say whether agranulocytosis is one of the many manifestations of such a genetically and/or constitutionally determined allergic reaction (an assumption strongly suggested by a number of its symptoms) or whether it is a genetic or constitutional weakness of the myelopoietic apparatus as shown by abnormal response to certain substances, or whether it belongs to another category altogether. What seems of importance, however, is to take into account genetic and constitutional factors if we want to arrive at a better understanding of the syndrome of agranulocytosis.

Careful family anamnesis, particularly with intelligent patients, is therefore essential in cases of agranulocytosis. This should cover allergic conditions and abnormal reactions to drugs (stating which drugs); what is known about blood diseases, particularly of the myelopoietic system; specifically genetic points—e.g., consanguineous marriages—in the ascendant of the patient; where the agranulocytosis patient happens to be a twin observations should be made on the twin partner.

The sulphanilamide and sulphapyridine therapy, so widely applied in wartime, and the increased frequency with which, in consequence, cases of agranulocytosis occur, give ample opportunity for the elucidation of our problem. The Bureau of Human Heredity (as stated in the report quoted in the opening paragraph) has set itself the special task of collecting, sifting, and classifying this and similar material. The facilities are available to medical men and research workers interested. The Bureau would therefore be grateful if all material collected on the lines indicated were placed at its disposal.

* Possibly the description—"failure of development"—more accurately describes the condition.

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It is estimated that over 35,000 men have benefited under the "Fitness for Service" scheme which was inaugurated in June last by the Central Council of Recreative Physical Training assisted by the Football Association. Arrangements have already been made for the winter accommodation of approximately 120 centres. The Central Council, a voluntary organization, is working in conjunction with the Directorate of Physical Recreation, recently set up by the Board of Education.

Nova et Vetera

THE KNIGHTS HOSPITALLERS

Medical Work of the Knights Hospitallers of Saint John of Jerusalem. By Edgar Erskine Hume, Lieutenant-Colonel, Medical Corps, United States Army. (Pp. 371; illustrated. $3.00.) Baltimore: The Johns Hopkins Press. 1940.

The Knights Hospitallers of St. John of Jerusalem began about the year 1165 to protect the sick and needy Crusaders—*hospitalitas*, as it was then called. Times were rough but chivalrous, and what began as a civil organization soon became a powerful military Order. Colonel Hume of the United States Army Medical Corps traces its history through the many changes it has undergone during the centuries, and claims correctly that it is the first time the whole story has been told in English.

From the Holy Land the Order migrated to Acre, from Acre to Cyprus, from Cyprus to Rhodes, and from Rhodes to Malta. Its members are still active and carry out the objects for which the Order was founded. Catholic it began, and under the Catholic Church it remains. Little, therefore, is heard of it in Protestant countries, but its sphere of influence has widened and the principles it inculcated are now world-wide.

The attention of Colonel Hume seems to have been first called to the Order when he was acting as Commissioner of the American Red Cross in the Balkan States during the war of 1914–18. He became interested in the Order, and in 1937 was a delegate from the United States to the ninth Congress, which was held at Bucarest. He speaks, therefore, with authority; and, being a skilled linguist, has produced a standard work. It will be referred to by several different classes of readers. The historian will consult it for many facts useful in telling the story of the sick poor. Medical officers of the Navy and Army attached to the garrison at Malta will read with renewed interest of the magnificent buildings which are still in use: of the castle of Sant Angelo in the Grand Harbour; of La Valetta and L'Isle Adams's fortifications which to-day are withstanding the bomber; of the Auberges of the different Langues; of the Armoury and of the fine church of St. John. Many members of the Services pass them on their way to the club and the opera house, but too often with eyes that see not. Those of the English Order of St. John will read the book, and it is of equal interest for members of the Red Cross.

Colonel Hume has illustrated his book well, and has been especially honoured in being allowed to photograph for the first time the hand of St. John the Baptist, the most precious relic in the Royal Chapel at Belgrade. He has also obtained a photograph of the Ossuary chapel at Valletta, to which it is usually most difficult to gain admission. It may be stated for his information that Sir G. T. Beatson gives better and more modern illustrations of the Priory of Torphichen than Colonel Hume has been able to obtain. They appeared in *The Knights Hospitallers in Scotland and their Priory at Torphichen*. The little account was published at Glasgow in 1903 by James Hedderwick and Sons at the Citizen Offices.

D'A. P.

AZTEC MEDICINE

Englishmen know very little about Mexican medicine in pre-Columbian times except for Monardés's *Joyful News of the New Found World*, of which an edition appeared in 1925 under the supervision of Sir Stephen Gaselee. Miss Emily Walcott Emmart, therefore, has done good service by publishing with an English translation a facsimile of the Badianus manuscript now in the Vatican Library.[1] The volume appears in as sumptuous a form as it is complete—a large quarto with 118 plates in colour and an elaborate textual apparatus of notes, commentaries, and indexes. It is difficult to allot the greater praise to Miss Emmart for her learning and accuracy, to the Johns Hopkins Press for the mechanical production, or to the public spirit which has provided the money. It makes one very envious to read of the help given by the Smithsonian Institute, the Herb Society of America, and the Garden Club of America, for it shows that the people of the United States are far in advance of ourselves in the furtherance of such an enterprise.

The manuscript, which is headed "A Little Book on Indian Medical Herbs," was written in 1552 on loose pages in Aztec by Martin, a native teacher of the language in the College of the Holy Cross at Santiago. It was translated into Latin by John Badianus, who taught Latin there, and was dedicated to Francis Mendoza, son of the first Viceroy of Mexico. There is an abridged Italian copy in the Royal Library at Windsor. The manuscript throws a vivid light on the policy pursued by the Emperor Charles V in dealing with the vast population which had come under his control in the New World. An educational system was soon provided to teach the people to read and write in Spanish, and about 1530 the College of the Holy Cross was founded at Santiago, where the more promising boys learnt the humanities, music, medicine, and, no doubt, theology from specially appointed teachers.

As regards medicine, women as well as men were allowed to occupy themselves with the cure of disease. The grades were well defined, but there is no mention of specialism. The physician was accompanied in his visit to the patient by a sorcerer, but charms were not much used; the surgeon attended to injuries, undertook massage, employed stiff casings to bones and joints, and dealt with the bleedings which formed an integral part of the therapeutic system; the midwife appears to have given advice to the mother before and after childbirth. The remedies employed were largely herbal, and the coloured plates show that the doctrine of signatures took some part in their selection. Lotions, tinctures, plasters, and pastes were largely used.

The complaints treated were numerous: lice, scabies, and impetigo were rampant, borborygmi were common, associated perhaps with the vegetable diet; stinking axillae were offensive, and there are many remedies which are as much wanted now as when the manuscript was written. There are prescriptions for "loss and interruption of sleep," "the cure of drowsiness," and "for the fatigue of those administering the government and holding public office."

D'A. P.

[1] *The Badianus Manuscript* (Codex Barberini, Latin 241), Vatican Library. An Aztec Herbal of 1552. Introduction, translation and annotations by Emily Walcott Emmart. With a foreword by Henry E. Sigerist. Pp. 341; 53s. 6d. net.) Baltimore: The Johns Hopkins Press. 1940.

MEDICAL EDUCATION UNDER AIR-RAID CONDITIONS

POSITION OF THE LONDON SCHOOLS

Never in their history have the London medical schools faced such a situation as now presents itself. Last year the students were dispersed among various hospitals in the respective sectors, but this year it had been hoped to resume more normal working. The intensive bombardment of London, however, during the month preceding the opening of the winter session, and the damage done to a number of teaching hospitals, has led to rapid changes of programme.

The dean of Westminster Hospital Medical School, for example, states that a month ago he was optimistic regarding the arrangements, but the happenings of recent weeks have altered the situation completely. The outstanding problems are the absence of clinical material at the hospital and the difficulty of supplying it at a distance from London. Similarly at Charing Cross, although fairly full courses have hitherto been carried on, the intensification of aerial warfare has resulted in a considerable falling off in the amount of clinical material available. In both these hospitals possibilities of overcoming the difficulty are being explored.

The dean of St. Bartholomew's states that the first-year students are now housed in University Laboratories, Cambridge. The clinical students this year had again been distributed into three different hospitals—St. Bartholomew's itself, Hill End, and Friern. The entry of students is about the same as last year, and the grade equally high. A certain number of patients remain, and the out-patient departments are in running order.

At Guy's students preparing for the first and second examinations are receiving their tuition at temporary premises at Tunbridge Wells. The number of medical entries is up to the normal. The hospital is dealing only with out-patients and emergencies. The second- and third-year students of the London (Royal Free Hospital) School of Medicine for Women, who on the declaration of war were accommodated at Aberdeen, have returned to London since Easter, and it was hoped that the first-year students, who were at St. Andrews, would also be back for the new session, but owing to present conditions arrangements have been made to accommodate all the pre-clinical students at University College, Exeter, and the clinical students are divided between the Royal Free Hospital, a base hospital, and St. Albans.

University College Hospital Medical School is sending its October entry to the Welsh National School of Medicine at Cardiff, and concentrating the second- and third-year students near Watford. A certain number of students will do duty at University College Hospital itself, where they will have the opportunity of casualty work and of seeing out-patients. The new entry for the first clinical year consists of thirty-three students who are going to Cardiff, and the number remaining in the London district is approximately 200.

From St. Mary's comes an optimistic note. For some years the entry to that school has been kept down in order that there should be no crowding in the clinical years. The great addition of beds available for clinical teaching provided in the sector has made it possible to increase the entry without increasing the number of students per bed. Increased use is being made of two large hospitals belonging to the Middlesex County Council, and in addition there are four large hospitals in the London area—St. Mary's itself, the Postgraduate Hospital at Hammersmith, and two L.C.C. hospitals—available. At St. Mary's the out-patient teaching is not greatly different from that available before the war, while the diminution of patients in the wards is far more than made up by the clinical opportunities offered elsewhere. The facilities available for teaching obstetrics are as good as in the pre-war period.

A similar note is struck by the dean of London Hospital Medical College. The entry at the London Hospital for the coming session is about normal for both pre-clinical and clinical students. The hospital itself has been hit several times, although no damage has been done to the walls and there have been no casualties. It has been thought wise, however, to reduce the number of beds, and now only acutely ill people and casualties are admitted. Systematic teaching has been started, and sundry clerks and dressers are distributed to the neighbouring County Council and sector hospitals, where they work in the mornings and come to the London for systematic teaching in the afternoons. Intermediate students have been distributed to sector hospitals more remote from London. No attempt has been made to move the London Hospital or the medical college to another centre outside London, but it has been preferred to make full use of the sector organization, so that instead of 800 beds at the London as before the war there are now over 10,000 beds in the sector hospitals available for clinical teaching. "The education," says the dean, "is probably less academic, but more practical, than in the past. I am sure the students are getting wider experience."

The emergency arrangements made by St. Thomas's for its students were described in the *Journal* of October 12 (p. 500).

A base hospital at Nahalal in Palestine for British Forces serving in the Near East is to be built and equipped by the Canadian Hadassah, the Jewish Women's Zionist organization. The National Executive Committee has also decided to equip a thirty-bed ward in a hospital in England for Canadian soldiers.

PRODUCTION OF DRUGS AT HOME AND WITHIN THE EMPIRE

In the Middle Ages the garden and the beehive were "all our physick and chyrurgery." Nevertheless only a small number of medicinal plants of value can be grown in this country. It is understood that the Ministry of Health has collaborated with the Ministry of Agriculture to ensure adequate home supplies of the big four—belladonna, hyoscyamus, stramonium, and digitalis—while independent scientists are working along genetic and ecological lines to increase the yield of active principles from home-grown stocks of these plants. The Therapeutic Requirements Committee of the Medical Research Council has also recommended the production or collection of the following medicinal plants in Great Britain:

*Anethum	Hamamelis
Caraway	*Liquorice
Chamomile	*Peppermint
*Chondrus (Irish moss)	Pyrethrum
Colchicum	Psyllium
Datura (for production of hyoscine)	Seaweeds for the production of iodine
Fennel	Taraxacum
*Filix mas	Valerian

The intending herb-grower should consult the excellent bulletin on herbs published by the Ministry of Agriculture,[1] and he must learn that owing to the difficulties of drying, marketing, or distilling, the business of growing the herbs used in perfumery, confectionery, and medicine must be well organized and carried out on a large scale to succeed. In recent years the industry has languished through inability to withstand foreign competition. Our advice to the amateur gardener or small-scale cultivator is not to embark on growing medicinal plants unless he has been officially asked to do so or has made sure that he can dispose of the crop. He may well be wasting ground which would be better employed raising food for people or livestock.

Drug-growing Over-seas

The position as regards our oversea possessions is very different. There is no important drug in the *British Pharmacopoeia* which could not be grown profitably within the Empire, and it is most undesirable that we should remain dependent on foreign countries. A recent source-book of our common drugs shows that Formosa produces about 75% of the world's supply of camphor, and Japan about 60% of the world's supply of menthol and most of the agar. Ephedra comes largely from China, and Java still produces about 90% of the world's requirements of quinine. Hamamelis and oil of chenopodium come almost exclusively from the Eastern U.S.A., while Brazil supplies practically all our chrysarobin, ipecacuanha, and jaborandi. Some of these facts have been modified by the march of time and the policy of self-sufficiency pursued by the Axis Powers, but the position has not altered in our favour. Mr. Ghosh, whose book on the *Indigenous Drugs of India* was recently reviewed in our columns,[2] states that half the drugs of vegetable origin in the *British Pharmacopoeia* are indigenous to India, and that nearly all the *B.P.* drugs could be grown there. Nevertheless, India in most cases actually fails to supply her own needs, the most striking example being quinine, of which India uses 200,000 lb. a year, needs at least 600,000 lb., but produces only 70,000 lb. India is not alone, for Australia, Africa, and our other Dominions and possessions over-seas can provide every climate from the Alpine to the steaming heat of the Tropics, and one cannot readily find excuses for the fact that the Empire as

[1] "Herbs." Bulletin No. 76, Ministry of Agriculture and Fisheries, H.M. Stationery Office, 1936.
[2] *British Medical Journal*, 1940, 2, 491.

a whole suffers from gross under-production and under-consumption of drugs. The Therapeutic Requirements Committee has, therefore, compiled a list of drugs whose production within the British Empire should be encouraged. In some cases this must be a long-term policy, but this is obviously no time for short views.

Acid tartaric	Ipecacuanha
*Agar	Jaborandi
*Benzoin	Krameria
Balsam of tolu	Lobelia
Calumba	*Menthol (synthetic or natural)
*Camphor (synthetic or natural)	Almond oil
Cantharides (mylabris)	Oil of anise (star anise)
*Cascara sagrada	Oil of cade
*Cinchona	Oil of chenopodium
Chrysarobin	Oil of lemon
Coca	Oil of peppermint
*Creosote	*Oil of turpentine and colophony
*Datura	Psyllium seeds
Derris	Rhubarb (*Rheum palmatum*)
Ephedrine (synthetic or natural)	*Santonin
Ergot	*Squill
Gentian	Storax
Glycyrrhiza	*Thymol (synthetic or natural)
Hamamelis	*Tragacanth
Hyoscyamus muticus	

* These drugs are regarded as of special importance.

HEALTH IN REST CENTRES AND AIR-RAID SHELTERS

Sir Arthur MacNalty, with officers of the Ministry of Health and representatives of the Ministry of Home Security and the Department of Health for Scotland, met the medical officers of health of the metropolitan boroughs at the Ministry on October 10 to discuss measures for the prevention of epidemic and other diseases in rest centres and air-raid shelters. Lord Horder and Dr. Daley of the London County Council were present and took part in the discussion. Sir George Chrystal, who was in the chair, explained that the primary responsibility for the control and management of shelters belonged to the Ministry of Home Security, but the Ministry of Health had a great interest in and responsibility for matters affecting public health. Lord Horder's Committee had made recommendations which were necessarily in general terms.

Referring to rest centres, Dr. Daley stated that the London County Council was providing doctors and nurses, sick bays, and drugs at the centres on behalf of the Ministry of Health. The beds available for the chronic sick had been for various reasons greatly reduced, but hospital provision was being made for such persons. People were staying too long in the rest centres, and it was agreed by the meeting that local authorities should be pressed to expedite the provision of billets and the emergency repairs to houses.

The meeting considered that it was not practicable to prevent persons suffering from infectious disease from entering shelters, and a suggestion for some form of cursory inspection at the entrance was discussed but rejected. The real solution consisted in reducing the numbers using the shelters by evacuation of the population to less crowded parts of the country. There was some difference of opinion whether the provision of bunks would necessarily mean a reduction in the number of persons using the shelters. Various suggestions put forward in a report by Dr. Maitland Radford (St. Pancras) were received with approval, and it was stated that the question of payment for the medical and nursing work involved was under urgent consideration by the Ministry of Home Security. The desirability of compulsory inoculation against diphtheria and typhoid was discussed. It was agreed that it would be difficult to arrange for a doctor to be in continuous attendance in the shelters, with the exception possibly of very large ones, but some scheme should be worked out in each borough that would ensure that the services of a doctor were available for cases which could not be dealt with by nursing and first-aid personnel. Dr. Fenton described the operation of such a scheme in Kensington. Other facilities which, it was considered, should be provided were Red Cross nurses with training in home nursing and space for sick bays. The presence of nasopharyngitis was referred to, and scabies of a septic type was recorded from one area. It was stated that Lord Horder's Committee was considering the question of disinfection and disinfestation with the aid of expert committees of the Medical Research Council, and that the Ministry of Home Security would shortly issue a code of good conduct by-laws for shelters.

NATIONAL FOOD EDUCATION CAMPAIGN

The Ministry of Health has circularized welfare authorities in England urging them to give their utmost support to the food education movement which the Ministries of Food and Education inaugurated last April. That movement, known as the National Food Education Campaign, has for its object, as was pointed out in the *Journal* at the time (April 13, p. 627), the promotion of sound nutrition as well as care and economy in the use of unrationed foods and the reduction in imported supplies. It has been conducted through the medium of broadcast talks, Press advertisements, and classes in wartime catering and cookery organized by local education authorities. The Minister of Health now considers that the personal contacts made by medical officers and health visitors through their ordinary duties afford special opportunities for imparting knowledge of food and nutrition. While it is recognized that instruction in diet forms a considerable part of the advice already given to mothers in clinics, welfare authorities are asked to intensify this work and bring it into line with the National Food Education Campaign, which will be so directed as to encourage the use from time to time of those foods which are plentiful and economy in those which are scarce. The circular points out that particulars of classes, which can be obtained through the education authority or local food office, can usefully be shown in clinics and centres, and welfare officers can take a more active part in the campaign by giving simple demonstrations and talks on nutrition in clinics, in the mothers' homes, or in clubs. Here we would remind medical officers, and indeed all welfare workers, of the advice and help to be gained from a study of the booklet entitled *The Doctors Tell You What to Eat in Wartime*, which was first published in June.[1] This is an attractively printed booklet, which discusses in an easily assimilable form all the different foods with special reference to the protective foods, and contains advice on such important matters as safe milk and the vitamin content of the commoner articles of diet. Full particulars of the supplementary services which the Ministry of Food has organized, such as a film library, a panel of speakers for local meetings, bills, leaflets, etc., can be obtained from the Food Education Division, Ministry of Food, Colwyn Bay, N. Wales.

[1] Obtainable from the British Medical Association, Tavistock Square, W.C.1, or any bookseller, price 3d.

Local News

SOUTH AFRICA

The Health of Capetown

Capetown is an interesting city from the public health point of view, because its population of 315,000 is almost equally divided between Europeans and non-Europeans, the latter consisting chiefly of the mixed race known as "Cape coloured," largely the descendants of slaves of earlier days. The latest annual report of the medical officer of health, Dr. Shadick Higgins, gives the birth rate for the Europeans as 18.1 and for the non-Europeans as 46.69 per 1,000 population. The death rate for the Europeans is 10.12 and for the non-Europeans 21.68 per 1,000 population. From the broad statistical point of view, taking the last twenty-five years, the birth rate of the European population has sharply declined, that of the non-European population has remained constant, and the death rates of both populations have been lowered. Infant mortality has been reduced by more than one-half for both Europeans and non-Europeans, but it remains three times as great for the latter as for the former. The principal causes of mortality for the Europeans are diseases of the heart and arteries, cancer, and tuberculosis, in that order; and for the non-Europeans, tuberculosis, bronchitis and

pneumonia, and diseases of the heart and arteries. Among Europeans the death rate for males was 38.1% greater than the death rate for females, the corresponding figure among the non-Europeans being 15.8%. Thirteen maternity and child welfare centres are maintained in Capetown, with fifty-six medical (or dental) sessions a week. Notifications of and deaths from enteric fever have shown an almost consistent decline among both Europeans and non-Europeans, and in the year under review the figures were the lowest on record. The non-European mortality rate from bronchitis and pneumonia is six times that of the European, and that this is not merely the result of a difference in age constitution is shown by the fact that in children under 1 year the non-European mortality from these diseases is four and a half times as great as the European. Capetown is concerned over its relatively large incidence of venereal diseases. The number of new cases during the year was 3,800, or 12 per 1,000 of the population, contrasting with 8.5 per 1,000 for Johannesburg, and with smaller figures for English and Scottish cities. There were five times more non-European cases of syphilis than European.

Correspondence

Débridement

SIR,—It would be unfortunate if arguments based on history or etymology were to succeed in removing the word "débridement" from its present useful place in the vocabulary of war surgery. Mr. William Mackenzie (October 12, p. 503) tells us what it meant to Desault and Larrey and what it means in French; Desault and Larrey are dead, and the word is now as English as "lavage" and "tourniquet." Mr. Reginald T. Payne (October 12, p. 503) says that it is now used so loosely in surgical papers as to have little exact meaning. I should rather say that it is just because it has come to represent in one word a series of technical steps whose description would otherwise take a paragraph that it must be kept for that purpose. As one who learned his surgery in the last war I should say that "débridement" was given its present meaning by the French surgeons of that period, and adopted to describe the same procedures by British writers. I tried to put my interpretation of that meaning into the *Lancet War Primer*:

> "The prophylactic excision of contaminated wounds, often called débridement, consists, in theory at any rate, of the excision of the whole wound track and of all damaged and devitalized structures round it, the removal of blood clot, dirt, and foreign material, and the complete arrest of haemorrhage from the excised surfaces" (p. 60).

Trueta (*Treatment of War Wounds and Fractures*, p. 25) writes: "The removal of all foreign matter, the excision of all the tissues immediately surrounding the wound, including devitalized soft parts in the vicinity, and the opening up of cellular spaces—is known technically as débridement." Hamilton Bailey, as quoted by Mr. Mackenzie, seems to hold similar views; Mercer and Jolly describe the same surgical toilet of war wounds without calling it débridement. It is to this series of steps most surgeons would attach the word to-day, and I cannot see that we gain anything, and fear that we may lose much, by taking it from them.

Language is a sensitive and living medium, always growing and changing, always adapting itself to the spirit of a people and the needs of a time. New words come and old words acquire new meanings. If they are clearer, more beautiful, or more striking than those they displace, if they say more with greater economy, they survive, and the old word and the old meaning become obsolete. To employ them after they have disappeared is either pedantic or meaningless. The writer of the collect for the seventeenth Sunday after Trinity uses the word "prevent" to mean "go before"; but if I used it in that sense to-day, remarking to my anaesthetist that his administrations had "prevented" my operation, I should be misunderstood.

It is difficult to see that "surgical revision"—Mr. Payne's choice—can replace "débridement." Revision essentially means doing again something that has already been done, and suggests critical assessment rather than operative procedure. "Surgical revision" is applicable to cramming classes for the final examination, to a ward round of surgical cases, possibly to the final overhaul of a wound at the end of débridement, but not to débridement itself. Please let us keep "débridement." It may be bad history and bad French, but as surgical jargon it cannot very well be spared or replaced.—I am, etc.,

London, W.1, Oct. 17. W. H. OGILVIE.

Spread of Disease in Shelters

SIR,—With the advent of the epidemic season and the risks, among others, of acute respiratory infections the winter campaign which is to be waged—as Mr. Ritchie Calder puts it in an admirable article in the *New Statesman and Nation* to-day—by the doctors on the Home Front becomes quite as significant as the active warfare waged by the Services. An epidemic of influenza and its sequelae become even more alarming under the unfavourable conditions of crowded shelters, whether public or private.

My own experience confirms Dr. P. L. T. Bennett's observations (October 12, p. 502) on the prevailing practice of many tuberculous patients who seek refuge in Anderson or public shelters. In thickly populated districts, such as the East End of London, presumably healthy subjects, including mothers and children, run the grave risk of contact with advanced and open cases of lung tuberculosis, although previously such diseased cases have been able to secure some measure of segregation from other members of their family and the community at large. It might be suggested that all tuberculous patients should, in their own interest and that of the public health, be accommodated in sanatoria, or, better still, in colonies similar to Papworth; but while this may be ideal in theory it is impossible in practice at the present time. Even in peacetime the problem of the advanced tuberculous subject has never been properly solved, and his compulsory isolation has not been achieved. A certain number who have already had institutional treatment and are endeavouring to continue with the sanatorium regime have wisely evacuated to the country. Whether rural areas can cater for special forms of treatment is problematical, but at any rate such cases as have evacuated do lessen to some extent the tuberculosis problem in congested and dangerous areas.

There still remains, however, the comparatively large group of tuberculous subjects, some of them obliged to continue their work, others bound by family ties; and, further, there are the numerous advanced cases unable to gain admission to special hospitals in the London area and with no definite place in rural areas to which they can be evacuated. During an epidemic of influenza and acute respiratory infections the danger of such cases to themselves and others will be increased to such an ominous degree that the spread of the tubercle bacillus becomes a weapon no less deadly than bombing itself.

The timely report of Lord Horder's shelter committee would appear to render a solution of the control of tuberculosis in shelters somewhat less unattainable. The medical and sanitary arrangements are to come under the control of the local medical officer of health, and the introduction of season tickets should enable doctors in charge of large shelters to insist on an initial general health examination (access to the public health records and school health files should assist in this). There should, furthermore, be periodic health examinations for the renewal of the season ticket, and doubtful cases should be referred to a consultant in the same way as recruits are referred by the recruiting board. In this connexion mass miniature screen photography, which has aroused a lively discussion in your *Journal* in respect of the examination of recruits, would prove an invaluable aid in detecting macroscopic pulmonary disease. So far as tuberculosis cases are concerned the names of all patients notified in a given area would naturally be available to the examining doctor from the records of the medical officer of health. In this way is should be possible: (*a*) to demand the compulsory isolation by ambulance service of all advanced cases to special institutions in the country; (*b*) to secure institutional treatment of early cases of pulmonary tuberculosis; (*c*) to evacuate all known infective cases not engaged on essential work to safe areas where it will be possible to maintain the necessary hygienic routine and discipline; and (*d*) to arrange for those quiescent tuberculous subjects engaged on essential services special shelter facilities. The cost of all such services would

in the long run be more than repaid by the prevention of the spread of respiratory diseases and, in particular, of tuberculosis, which in years of peace has shown such an appreciable decrease.—I am, etc.,

London, W.1, Oct. 19. PHILIP ELLMAN.

Evacuee's Sore Throat and Shelter Tonsillitis

SIR,—Dr. Johnson in the preface to his *Dictionary* wrote: "For as nothing can be proved but by supposing something intuitively known, and evident without proof"; but this cannot be applied to the conclusions which Mr. T. B. Layton draws in his account of evacuee's sore throat and shelter tonsillitis (October 19, p. 531), an article which has received publicity in the lay press. His observations were largely among probationer nurses and clerks from banks and offices, in whom tonsillectomy, far from benefiting the condition, sometimes increased its duration. Why should this be regarded as an indication for the institution of a "closed season" for tonsillectomy in children attending school clinics from now until March 21, a period of more than five months?

The only argument in support of this astounding proposal is that the condition is usually better for six weeks' delay; but not on that account five months' postponement. No doubt other ear and throat surgeons to the educational authority, as well as I, see children who require tonsillectomy in less than five months and for affections other than evacuee's sore throat and shelter tonsillitis. Also there is the question of bed accommodation, which is now far from adequate and would not be helped by undue congestion in the spring and summer time.—I am, etc.,

Gloucester, Oct. 19. C. DE W. GIBB, F.R.C.S.Ed.

The Mobile Unit in Action

SIR,—In answering Dr. G. O. Barber's letter (October 12, p. 507) on this subject permit me while recounting our experiences to put forward a plea for the more frequent employment of these expensive units in the capacity recommended by the Ministry—that is, as casualty clearing stations. Before the commencement of the aerial attack on London I had devoted considerable time and attention to team work and functioning of a mobile unit and have visited a considerable number of units in the London area. The personnel as laid down by the Ministry consists of eighteen (twelve nurses and six men) working in eight-hour shifts on duty, eight hours on call, and eight hours' rest. In addition, there are a sister, medical officer, and two drivers (the latter on twenty-four-hour shifts). Owing to barrage the "on call" duty is unpractical, and we have substituted a twelve-hour service, which is found more satisfactory and avoids the risk of personnel coming through the streets at night during a raid. It also abolishes the weekly day off, which interfered considerably with team work.

A mobile unit's work, as recommended by the Ministry, may consist of the following functions: (1) treatment of ambulant cases; (2) treatment of trapped cases; (3) acting as a casualty clearing station; (4) urgent stretcher cases requiring treatment before removal to hospital. Before the attacks on London our unit practised all these functions by day and night, co-operating with each warden's post, rescue party, and stretcher party in the borough, as we realized that without their co-operation, as they were the first people to handle the casualties, our work would be useless. In all these exercises these parties were instructed to look out for our Red Cross indicator (illuminated at night) and through the incident officer or post warden to direct all casualties through our post.

Unfortunately, or perhaps fortunately, things have not turned out as expected, and most victims of raids are either killed outright, trapped, or slightly wounded. Consequently, even in this borough, which has suffered perhaps more than any other except the East End, the mobile unit has only acted once as a unit. On that occasion a big bomb landed on a large church which had shelter accommodation below for 400 people. A gas main was set alight, and some houses in the neighbouring streets were either entirely demolished or rendered quite uninhabitable. On arrival at the site of the disaster (brightly illuminated by the gas flare) we set up shop in a local hall-warden's post, where we had practised in peacetime. Here equipment was carried in and the unit set to work, each member being detailed to a case after inspection by the medical officer, the sister administering A.T.S. and morphine. To add to our difficulties the windows and black-out had disappeared and we had to work with very shaded lights. Twenty casualties were dealt with before we packed up for home, and as we turned for home Jerry bade us farewell with three small bombs which landed on the road near the rear of the van. The team responded promptly to the order to "duck" given by our No. 1 man, and so back to hospital to our "funk holes" below tables, etc., till early morning, when sister, myself, and another nurse were summoned to a trapped case. Since this occasion our work has been confined to trapped cases, of which we have had about a dozen. Controls, considering it unwise to risk the whole unit, have sent a car for the medical officer, sister, and a nurse. On these occasions morphine, coramine, and oxygen have all been used, and rescue parties advised on best methods of rescue compatible with safety and care of the victim. Rising water and escaping gas have made work very difficult in some of these cases.

There is a growing tendency to decry the usefulness of these mobile units, but this is only because they have not been tried out sufficiently in the sphere in which they can be of most use—as casualty clearing stations. Nor have the wardens and stretcher parties been instructed sufficiently in an incident of any magnitude to look out for the mobile hospital and to direct all stretcher cases and casualties through it. Should the mobile hospital through delay not be immediately available the incident officer or post warden, whoever is first on the scene, might set up a large Red Cross indicator to which any local practitioner might rally the cases, pending the arrival of the mobile hospital.

The suggestions made by Dr. N. Mortimer Vallely (October 12, p. 498) on dealing with casualties at an incident are admirable, and I should welcome their adoption, but why institute and train another unit when each borough has at least one hospital unit well trained and equipped, and costing at least £60 per week in personnel alone since the beginning of the war? To-day a case has come to hand in this borough of a factory being bombed. The unit was not called out, all casualties were taken direct to the nearest hospital, incidentally throwing a great strain on the much-needed ambulance service (other incidents the same morning). This hospital soon became overrun with serious and non-serious cases, and another hospital was called on to receive the overflow. Surely this is what the Ministry tried to avoid in setting up mobile units.

In spite of my plea for mobile hospital units, should it be decided that they must go, might I suggest that the personnel be utilized in rest centres to which the homeless and apparently unwounded but often badly shocked cases are sent on the "All clear" signal? In my experience many of these patients subsequently collapse, and not a few of the older ones have died twenty-four to forty-eight hours later. The medical personnel of these centres consists of day and night nurse (sometimes to 400) and a medical officer visiting twice weekly. The mobile staff might visit these centres and make themselves responsible for the care and attention of these people, deputizing voluntary workers to, say, every six cases, these workers also making themselves responsible for the clothing and housing. These people are not in a fit condition mentally or physically to fill up vouchers and get in touch with relations. Trusting something can be done soon in this urgent matter.—I am, etc.,

J. F. MACKIE,
Oct. 16. M.O., Mobile Unit.

SIR,—Dr. G. O. Barber's letter on this subject leads me to say that I have found the mobile unit to be one of the most effective elements in the casualty service. The mobile unit here is staffed continuously throughout the twenty-four hours, except that the doctor in charge goes to the unit's depot only on receipt of the "red" message. In action the unit, if only on account of the fact that a doctor goes with it, has performed work both of classification and of treatment which could not be done by ordinary first-aid A.R.P. personnel. With regard to the treatment of shock, the unit is in a position to supply hot stimulating drinks (coffee, tea, etc.),

hot-water bottles, and relays of warm dry blankets. Experience in this area up to the present has, I believe, amply demonstrated the utility of mobile units.—I am, etc.,

ADAM WHITE,
Medical Officer of Health.

Oct. 15.

Stretcher for Use in Private Car

SIR,—I would like to draw the attention of interested practitioners to a type of stretcher which can be used in a private car. It was constructed over a year ago, and has been very frequently used to carry all types of cases, with the exception of maternity cases, to the hospital twenty miles away. In many districts much time is wasted in waiting for an ambulance, especially in accidents out of doors. With this stretcher one has the benefit of the good springing and speed of a private car, qualities which are not always present in ambulances. The stretcher consists of two longitudinal wooden bars connected by two transverse metal bars hinged round a locking-pin, allowing the stretcher to be folded into small bulk when not carrying a patient. There are two legs made of light metal a short distance from each end of the longitudinal bars, and these legs fold into the handles when in the carrying position. The bucket seat to the left of the driver is removed, and the loaded stretcher is taken through the near front door. The rear handles rest on the back seat, and the metal legs support the end of the stretcher by the driver's seat. There is a locking device in the legs. The weight of the stretcher is 22 lb.; the length is six feet and the breadth twenty inches. In practice there is no difficulty in getting the loaded stretcher in and out of the cars, and two men are sufficient for this purpose.—I am, etc.,

A. A. MACLEAN,
Lieut., R.A.M.C.

Sept. 13.

Ocular Complications of Cerebrospinal Fever

SIR,—To the list of ocular complications of cerebrospinal fever—conjunctivitis, strabismus with diplopia, marked photophobia, ptosis, and iridocyclitis—recorded by Lieut.-Colonel R. W. Cushing (October 5, p. 439) in cases observed last winter can be added that of dendritic ulceration of the cornea. Such a complication occurred in a patient at No. 4 General Hospital, B.E.F., early this year. As the notes made at that time are not now in my possession a detailed account of the case cannot be given.

The patient was in coma when admitted, and it was during convalescence that marked photophobia developed. For several days the only visible lesions were small pin-point areas of the cornea which stained with fluorescein. These areas subsequently coalesced to form a large superficial ulcer which extended over most of the corneal surface. For about a week there was acute pain, and then the cornea became insensitive. Treatment consisted of hot bathings, the use of cod-liver oil drops, 1% atropine drops, and the occasional carbolization of the staining areas. Healing was slow, but at the end of several weeks, when the patient was invalided to the United Kingdom, the upper half of the cornea was clear and there was only a small area which stained in a nebula over the lower half. During a tour of inspection Colonel F. A. Juler, consulting ophthalmic surgeon B.E.F., also saw this case.—I am, etc.,

A. N. FERGUS,
Major, R.A.M.C.

Oct. 14.

Restrictions on Physiotherapy Apparatus

SIR,—My sympathies go to those unfortunates who are for the most part dependent on the income derived from physiotherapeutic treatment, such as diathermy and short-wave therapy. One reads in the lay press of a marvellous new "radio" treatment for the common cold employed in factories and apparently available to all and sundry who may care to visit the place. Meanwhile, the medical specialist in this branch who has nursed and developed this form of therapy since its inception in this country stands idly by waiting for his apparatus to be impounded by the Post Office. The Press comments on radio treatment now savour very much of the old ultra-violet lamp, which would bring sunshine and health to all and sundry, the panacea for all ailments.

The whole business of short-wave therapy now appears to be passing from the pioneer workers into the doubtful realms of popular medicine. The private patient with acute fibrositis or lumbago is now debarred from access to this treatment unless he goes to a voluntary or other hospital, but if one morning he suffers from a common cold he may, if he is fortunate, receive treatment at the hands of a "pretty masseuse" (*vide* daily press) at the factory. It seems to me that this suppression of a responsible minority is both unjust and unnecessary. The number of skilled workers in this branch is small, and with adequate screening interference with radio communication could be eliminated in one place as well as another. Whatever consultations have taken place before this ban was imposed, it seems to me that insufficient consideration has been given to the very men who have brought this treatment to its present stage of efficiency.—I am, etc.,

J. E. BANNEN.

Hull, Oct. 16.

Pressure Points of Arteries

SIR,—I would be grateful if you would allow me to suggest that an anatomist at one of the medical schools could do valuable work by looking into the matter of the pressure points of arteries. If "first-aiders" are taught at all to apply digital pressure to arrest arterial haemorrhage they ought to be taught accurately. I would go so far as to say that in the case of some of the arteries accurate teaching is impossible because the facts required have never been discovered. That sounds absurd, but it may be true. May I deal as briefly as I can with one artery?

According to *First Aid to the Injured* (published by the St. John Ambulance Brigade) the pressure point for the femoral artery is "at the centre of the groin." If the limits of the groin have not been defined it is obviously quite impossible to find the centre of the groin. But the textbooks on anatomy and surgery seem to be very little better than *First Aid to the Injured*. I am sure that the best place to apply digital pressure to the femoral artery is where the maximum pulsation can be felt just below the fold of the groin, but I cannot find any definition of this spot in the books. The mid-point of the line between the anterior superior iliac spine and the symphysis pubis is doubtless important to the surgeon, and, for all I know, it may have some relationship to the femoral artery that interests the anatomist quite apart from surgery, but it is not the best place to apply digital pressure and therefore it is quite useless to the "first-aider." When he has found this textbook point on the abdominal wall he has still got to find the pressure point below the groin. Instead of referring to a point on an imaginary line, and then looking for another point somewhere below it, would it not be very much better (at any rate for "first-aiders") to start with the real line of the fold of the groin and define a point on that line?

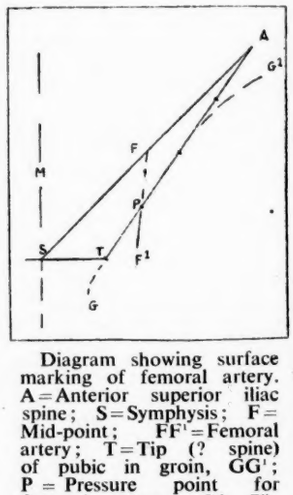

Diagram showing surface marking of femoral artery. A = Anterior superior iliac spine; S = Symphysis; F = Mid-point; FF¹ = Femoral artery; T = Tip (? spine) of pubic in groin, GG¹; P = Pressure point for femoral artery; SA = 7″; SF = 3½″ ST = 1½″; TA = 6″; TP = 1½″ = ¼ of TA. It is doubtful whether ST is in fact at right angles to SM, the middle line of the body.

I would suggest that the pressure point of the femoral artery is best defined as follows: Start from the outermost tip of the pubic bone *in the fold of the groin*. (It is very easily felt and demonstrated, but whether it is the anatomical spine of the pubis I do not know; I think not.) From this bony point the line to the anterior superior iliac spine follows the groin quite far enough for the purpose required; and the point of maximum pulsation of the artery is quite near

enough to the line for the definition required. The only question that remains is how far along this line. I have measured a few people, and make it exactly a quarter of the way up, but it ought to be done by someone better qualified and on a reasonably large scale. Perhaps an anatomist would think it worth while to measure some medical students. If it was found that the pressure point was a quarter of the way up and not some awkward fraction between a quarter and a third, it might be worth while checking it in the dissecting rooms. Then "first-aiders" (and perhaps others) could be told where the pressure point is. At present all we can do is to say that the pressure point is somewhere below the mid-point of the symphysis–iliac line. Even if we could say how far below, and in what direction, it would be a roundabout way of getting at it. I enclose a diagram showing the measurements.

Similar points arise in dealing with the subclavian artery, and it would be a help if someone would suggest the best way of defining the pressure point. To feel for the outer edge of the clavicular head of the sterno-mastoid just above the clavicle seems to be the best way.—I am, etc.,

Wetherby, Oct. 14. R. L. KITCHING.

Acute Intussusception

SIR,—The following case may be of sufficient interest to publish. It is the first in which I have had experience of the use of high rectal saline in the treatment of acute intussusception.

The patient, a male native infant of 18 months, was taken ill the morning of the day before admission with spasmodic abdominal pain, vomiting, and the appearance of blood per rectum. I saw him the next evening. He was very ill, was drowsy, with sunken eyes, and vomiting had continued. On examination the right iliac fossa appeared empty and there was a long palpable tumour of the left side of the abdomen extending into the pelvis. A finger in the rectum could touch the apex of the tumour. On withdrawal the finger was blood-stained. Acute intussusception was diagnosed. It was decided on account of the poor condition of the patient to attempt reduction by high rectal saline, and, if it failed, to proceed to laparotomy. The mother, however, refused to allow operation but agreed to the less drastic treatment.

Light ether anaesthesia was given. A large catheter was inserted well into the rectum and saline introduced from a douche-can three and a half feet above the table, care being taken to prevent leakage. After three to four minutes the catheter was withdrawn. Blood and flakes of epithelium came away with the saline, but no flatus or faeces. The tumour had receded from the rectum but was still palpable above. After the second attempt flatus passed but no faeces, and no tumour could be palpated with certainty. The process was repeated a third time with the same result; there was flatus but no faeces. It was decided to discontinue on account of the poor condition of the patient. Next morning he was much better and the bowels moved naturally. The next day he appeared absolutely normal, and his mother refused to leave him in hospital any longer.

I believe an interesting point in this case is that no faeces were returned in the saline. It is probable that complete reduction occurred after the child had been returned to bed.—I am, etc.,

J. F. MACDONALD, M.B., Ch.B., F.R.C.S.Ed.

Lusaka, Northern Rhodesia, Sept. 10.

Local Anaesthesia in General Surgery

SIR,—I have read with interest the article by Mr. Harold Dodd (September 14, p. 345) and the subsequent correspondence on the advantages of local anaesthesia in general surgery. I should like to add the experience gained by keeping the anaesthetic records at the Brompton Hospital in a series of 172 thoracoplasties over a period of three and a half years. During this period four types of anaesthetic were used for thoracoplasties: (*a*) Nitrous oxide, oxygen, and a trace of chloroform. Records are available in fifteen cases (six upper stage and Semb's operations: nine 2nd and 3rd stages). (*b*) Cyclopropane with a pentothal induction: sixty-nine cases (forty-one upper, twenty-eight lower). (*c*) Spinal: 1 in 1,500 percaine was used, 9 to 10 c.cm. being given in a modified Etherington Wilson technique. Only four cases were done by this method, and although the anaesthesia was satisfactory there was a marked drop in blood pressure and a lowered pulse pressure. (*d*) Local anaesthesia since 1938: eighty-four records (upper stage and Semb's operation, forty-nine; lower stages, thirty-five).

Three out of four surgeons at the Brompton Hospital now use this type of anaesthetic for thoracoplasties: procaine 0.5% and decicain 1 in 1,000 is used for the brachial plexuses and nerve blocks; 0.25% procaine and 1 in 2,000 decicain for the local infiltration; 3 minims 1 in 1,000 adrenaline is added to each oz. of the mixture.

The raised pulse rate mentioned by Dr. C. Langton Hewer (September 28, p. 428) is probably due partly to apprehension, but more probably to the adrenaline. When the patient has settled down and the effect of the adrenaline has worn off the pulse rate decreases, and in most cases after an operation lasting about 1 hour 20 minutes the pulse rate is less than at the beginning, in contradistinction to the pulse rate after a general anaesthetic.

The premedication given is omnopon 1/3 grain and scopolamine 1/150 grain one hour before the operation and another 1/3 grain of omnopon on being brought to the theatre, so that by the time the anaesthetist has completed the local anaesthesia the maximum effect is obtained. The majority of patients are co-operative with this method and do not object to returning to the theatre for a second or a third stage.

Comparison of Various Anaesthetics for 98 Cases of Upper-stage Thoracoplasty and Semb's Operation

Anaesthetic	Nitrous Oxide, Oxygen, and Chloroform 6	Cyclo-propane 41	Spinal (1 in 1,500 Per-caine) 2	Local 49
Cases having a higher pulse rate at end of operation than at the start	Percentage 100 (every case)	Percentage 90.3 (37 cases out of 41)	Percentage 50 (1 out of 2)	Percentage 12 (6 out of 49)
Cases having pulse pressure over 30 at excision of 1st rib	50 (3 out of 6)	68 (28 out of 41)	0 (no cases)	89 (43 out of 49)
Cases having pulse pressure over 30 at end of operation	66 (4 out of 6)	41 (17 out of 41)	0 (no cases)	65 (32 out of 49)
Drop in blood pressure at end of operation	50 (3 out of 6)	63 (26 out of 41—6 very severe)	Early drop in B.P., remaining low throughout)	16 (8 out of 49)

The accompanying table will, I think, show the advantages of local anaesthesia for this type of operation. Only upper-stage thoracoplasties followed by Semb's operation were taken into account, as this operation is longer in duration and there are more likely to be signs of shock.—I am, etc.,

RUTH E. MANSFIELD, M.R.C.S., D.A.,

Oct. 8. Assistant Anaesthetist, Brompton Hospital.

X-ray Diagnosis of Tuberculosis

SIR,—To those advocating the importance of *x* rays in the early diagnosis of tuberculosis or the diagnosis of early tuberculosis of the lung the annual report by the Chief Medical Officer of the Ministry of Health of the dispensary work is a challenging record. As a former clinical tuberculosis officer requested by the Ministry to submit the Leeds Dispensary work for the first trial return in 1925, I have closely followed these returns for the country appearing since 1926.

In a "Review of the Present Public Control of Tuberculosis in England," my statement in 1933, that in spite of the larger number of new cases examined and radiographed at the dispensaries the percentage of new cases and contacts diagnosed as tuberculous had fallen considerably, is supported by recent figures. Thus, for England alone in 1926 the new cases examined were 91,474, number *x*-rayed 23,469, and new cases and contacts diagnosed as tuberculous 46,894 (51.2% of the new cases). Ten years later, in 1936, the new cases increased to 94,313, the number *x*-rayed increased over five times to 121,951, whilst the number diagnosed fell to 37,982 (40.2%).

From recent annual reports, which include England and Wales, the new cases examined in 1933 were 103,794 and increased to 114,334 in 1938, *x*-ray examinations increased from 89,466 to 195,232. Thus in spite of over twice the number being *x*-rayed the diagnosed tuberculous cases for 1938 were only 40,742 (35.6%) as against 45,708 (44%) in 1933.

The eighteenth Annual Report of the Minister of Health (pages 25 to 27) stated in 1936 that there was an increase of 5.4% of new cases and 25% of those *x*-rayed over the previous year, whilst diagnosed cases were 1.4% less; the significant observation was made that this result did not suggest that the number of cases dealt with in the earlier and more recoverable stage of the disease had increased, and also that "it is regrettable that the proportion of such cases [deaths from tuberculosis not known until death] over the country continues so high from year to year."

As a member of a city health committee interested in a comparative study of other administrative areas with *x*-ray provision, I note that in a London borough where only 25% new cases are diagnosed as tuberculous 53% of notifications of death from tuberculosis were of less than a year's duration and 52.3% on a five-years average in a larger city. Also, the standard of diagnosis of new cases in dispensaries with *x*-ray installation varied from 17 to 75% of the new cases sent by local doctors on symptomatic grounds.

To those disappointed with Lord Horder's committee in not supporting mass *x*-ray examination of recruits, my experience as No. 2 examiner of a local board is that on an average session of thirty adults an experienced clinician may come across one or two suspected chest cases without any symptoms when an *x*-ray report from a dispensary proves negative and the benefit of a lower category of the examiner may be lost. There is, however, need for a special category in the medical board guidance for quiescent tuberculosis, for the varying type of non-infective cases, and those with medical evidence of dry pleurisy, pleurisy with effusion, or haemoptysis. Some of these, whilst not fit for active duties, could do lighter work and may save the nation pension claims if active disease follows as a result of higher grading. For two years as chief tuberculosis officer I dealt with a large number of Service men from the last war and established a diagnosis of tuberculosis whose aggravation by or attributability to the war was eventually accepted by a local pension board. Their original findings after discharge from the Army were either bronchitis or fibrosis, and in a number of them *x*-ray examination was not helpful during the period under doubt.—I am, etc.,

Leeds, Oct. 12. Z. P. Fernandez, B.A., M.D., D.P.H.

Supination after Fractured Forearm

Sir,—I have just seen another case of fractured forearm in which the power of supination has been lost. These cases are far too common. The biceps keeps the upper piece of the radius fully rotated out, so that the doctor who rotates the lower fragment inwards and fixes it there is making a gross mistake. Jordan Lloyd used to say fifty years ago: "Always put up a fractured forearm so that the man can spit in his hand."—I am, etc.,

Colchester, Oct. 13. J. R. Hickinbotham, M.B.

Diabetes and Associated Pathological Conditions

Sir,—In his Croonian Lecture entitled "A Review of the Causes of Diabetes Mellitus" (October 12, p. 479) Dr. George Graham states that the figures for changes in the pancreas are very disturbing, especially when it is remembered that in 23.7% of cases the pancreas appeared quite normal. He describes the two states of insulin deficiency and insulin inefficiency, elaborated by Himsworth (*Journal*, 1940, **1**, 719), and the many variations in response to insulin, and suggests that many of our difficulties would be explained by the variation in the activity of the hypophysis. The question is, Does the hypophysis originate these variations or are they secondary to some peripheral hormonic stimuli, the pituitary merely acting as a sort of switchbox?

In this connexion, perhaps, one may quote McGregor (*Journal*, 1937, **2**, 617), who reported two cases in which pernicious anaemia and diabetes were associated. He gave a review of the literature, from which it appeared that the two diseases have been found in association by many observers; sometimes the diabetes preceded the pernicious anaemia, sometimes this order was reversed. The first published result was by Parkinson (1910), who described the case of a man aged 49 with pernicious anaemia who developed glycosuria, ketosis, and coma, terminating in death. At necropsy the characteristic findings of pernicious anaemia were disclosed. The pancreas was normal macroscopically and microscopically. This case would lend support to a suggestion of MacCallum of a hormone in the intestinal mucosa, formed under the influence of sugar, which controls the secretion of insulin. McGregor remarks that, since pernicious anaemia is a deficiency disease, other deficiencies of this nature possibly co-exist. Achlorhydria is often found associated with diabetes, and points to a common aetiological basis.

I have not met in the literature any special study of the pathology of the mucous membrane of the small intestine in diabetes mellitus. Osler, however, stated that in diabetes dilatation of the stomach is common.—I am, etc.,

Southampton, Oct. 14. E. Sakoschansky.

The Geniculate Body and Colour Vision

Sir,—I am much interested in Prof. W. E. Le Gros Clark's suggestion of the relationship of the lateral geniculate body to colour vision (October 19, p. 537). I think he would agree that the final elaboration of colour vision is a function of the cortex cerebri. On the other hand, I have brought forward evidence,[1] based upon Head's researches, that the basal centres probably play a larger part in sensory phenomena than they have hitherto been credited with. On this theory the dyscritic (protopathic) visual phenomena originally had their neural basis in the superior colliculi, but with advancing epicritic differentiation the seat has been transferred to the lateral geniculate body and the occipital cortex. Prof. Le Gros Clark's suggestion naturally appeals to one who regards trichromatism as the best-established factor in human colour vision. At the same time too much stress must not be laid upon the phylogenetic argument, as there can be little doubt that specific adaptation in lower species must have led to neural differentiation different from that in the primates. I am afraid I do not agree with the statement about "peripheral vision, where recognition of colour distinction, of course, is not possible." There is overwhelming evidence[2] that with sufficiently strong stimuli peripheral vision in man is also trichromatic.—I am, etc.,

Leeds, Oct. 20. J. Herbert Parsons.

First-aid Lectures and Examinations

Sir,—Recent correspondence on first-aid teaching and examining has been most interesting and instructive, and several constructive criticisms—notably those of Drs. Savage, and McCall and Rosenberg—have been put forward. No one, however, has suggested the methods used by the London County Council—methods which appeal to me as being much fairer to candidate, lecturer, and examiner than any other. The lecturer is appointed by the head of the institute concerned because of his ability, and is kept on the staff only if he gets results. The examiner is appointed independently by the Council and conducts an impartial examination of candidates who are only numbers to him, so that the presence of a title (*vide* County Medical Officer) cannot influence him in his decision. Further, he is expected to submit a full report as to the standard of the class and the effectiveness or otherwise of the teaching. In this way many would-be lecturers who "read from the book" are weeded out and not re-engaged.

There is, of course, room for improvement in all the bodies concerned with the teaching of first aid. No purpose will be served by criticism of any of them, but I feel I must protest against the disgraceful methods employed in some districts in engaging stretcher-bearers. Courses of first-aid instruction were completed in four days of three two-hourly lectures

[1] *An Introduction to the Theory of Perception.* (Camb. Univ. Press.)
[2] *An Introduction to the Theory of Colour Vision.* (Camb. Univ. Press.)

a day, including practical work, and an examination of the flimsiest nature held on the fifth day. In a number of cases the level of intelligence of personnel was extremely low. Yet these men are expected not only to attend to every type of casualty from cut finger to fractured spine, but to make rapid decisions on the extent of the injuries and disposal of casualties with the aid of a subdued torchlight. The fault in this case lies not with the men but with the authorities, who were concerned only with numbers engaged and not with efficiency.

By all means let us have a committee representative of all bodies concerned and capable of cutting through all red tape and forgetting petty jealousies and pride. Such a committee could give us a syllabus and set a standard which, while not being impossibly high, would at least eliminate those candidates who "on qualification" become a menace to the community.—I am, etc.,

S. Smith,
Examiner and Lecturer in First Aid, L.C.C.

London, E.9, Oct. 14.

Universities and Colleges

UNIVERSITY OF CAMBRIDGE

In Congregation on October 18 the Senate, on the recommendation of the General Board, appointed Dr. R. A. McCance, Reader in Medicine, to act as Head of the Department of Medicine during the absence of the Regius Professor of Physic (Prof. J. A. Ryle) upon national service.

Part I of the Final M.B. Examination (Surgery, Midwifery, and Gynaecology) will begin on Tuesday, December 10, and Part II (Principles and Practice of Physic, Pathology, and Pharmacology) on December 11.

UNIVERSITY OF GLASGOW

At a graduation ceremony held on October 19 the following medical degrees were conferred:

M.D.—*L. D. W. Scott, R. Cameron.

Ch.M.—E. W. Grahame.

M.B., Ch.B.—‡R. B. Wilson, ‡A. J. Hird, ‡A. J. V. Cameron, ‡E. McC. McGirr, ‡H. Conway, †Isobel M. Marshall, †J. Hood, †A. W. Sloan, †E. A. Turner, †D. McD. Kenny, †Jean A. Paton, †G. H. Anderson, †J. B. Morrison, †R. A. Shanks, †J. Hamilton, J. Allan, H. Barron, D. Baxter, T. Y. Bennie, C. G. Blakeley, A. I. Bowie, W. N. Boyd, R. H. Bremner, J. C. Brown, J. H. Brown, J. Bruce, L. G. Bruce, J. R. Bryson, A. S. Burns, G. W. Burns, Agnes U. Campbell, G. MacL. Clark, A. B. Cormick, Margaret G. Cranmer (Mrs. A. J. Maclaren), Margaret C. S. Crocket, A. S. Crockett, A. P. J. Curran, R. M. Currie, R. J. Cuthbert, J. J. Docherty, J. Dolan, A. Donaldson, J. A. Donaldson, N. A. Douglas, J. D. Dow, Gertrude F. Drummond, Mary M. Dunn, J. P. Erskine, J. A. Evans, H. A. Fleming, G. W. Forrest, R. C. K. Foulis, R. Freeland, H. L. Gardner, Emilie E. Guthmann, L. A. Hardie, J. R. Hewett, J. Hutchison, J. M. King, J. L. Kirk, Annie D. Lindsay, J. Livingstone, J. W. Logan, D. MacAulay, J. H. McBeath, D. M. McClure, Helen H. McDonald, T. C. MacDonald, T. B. S. McDougall, J. C. W. MacFarlane, R. G. MacFarlane, G. P. McGowan, J. I. McGrouther, R. McInroy, J. W. McKendrick, J. McKerrigan, N. L. MacLeod, J. A. McNicol, D. Macrae, Mary S. Martin, D. M. Milne, I. W. Monie, M. J. Morton, Agnes G. Munro, I. P. Munro, W. L. Munro, Sophia E. M. Murray, A. Paterson, J. E. A. Paterson, Agnes C. Pope, H. Prentice, Anne R. Renfrew, S. Renfrew, A. S. Rennie, J. A. Ritchie, A. D. Robertson, J. F. Robertson, M. K. Rose, D. N. Ross, J. Savage, J. Scott, W. Scott, W. E. Scott, D. S. Service, E. M. Sewell, T. B. Shirkey, A. J. Sinclair, J. C. Skelley, A. C. Smith, J. M. Smith, T. Smith, P. Sullivan, Esther M. Swinnerton, G. C. Taylor, M. Taylor, W. A. S. Thom, J. M. Thomson, W. F. Tyrrell, H. D. Wallace, P. Wardlaw, A. C. Warnock, R. S. Weetch, J. C. R. Weir, W. F. White, A. B. Wilson, G. G. Wiseman, J. A. Young.

* With high commendation. † With commendation. ‡ With honours.

James Wilson Chambers gained the Brunton Memorial Prize as the most distinguished graduate in medicine of the year 1940.

The West of Scotland R.A.M.C. Memorial Prize was awarded to Robert Baird Wilson as the candidate with the highest aggregate marks in surgery, medicine, and midwifery in the Final M.B., Ch.B. examinations held during 1940.

The Macewen Medal in Surgery was awarded to Alister James Victor Cameron as the candidate who obtained the highest aggregate marks in surgery in the Final M.B., Ch.B. examinations held during 1940.

The Stockman Medal was awarded to Robert Baird Wilson as the candidate who obtained the highest aggregate of marks in the professional examinations in materia medica and therapeutics and medicine (written, oral, and clinical), excluding paediatrics, in 1940.

The John W. Weir Prize was awarded to James Wilson Chambers as the candidate who obtained the highest aggregate number of marks in midwifery and diseases of women in the final degree examinations in medicine held in 1940.

UNIVERSITY OF ST. ANDREWS

On October 11 Dr. Margaret Fairley was inducted to the chair of midwifery in the University. She is the first woman to be appointed to the professorate of a Scottish university.

The degree of M.B., Ch.B. was conferred on Donald Macleod Douglas, with honours for his thesis; and the Diploma in Public Health was conferred on James Roberts.

ROYAL COLLEGE OF SURGEONS OF ENGLAND

Arris and Gale Lectures

Professor John Beattie delivered two of a course of four Arris and Gale Lectures at the Royal Society of Medicine (1, Wimpole Street, W.) on October 21 and 23, when he spoke on haemorrhage. The remaining two lectures will be delivered by Professor Beattie on Wednesday, October 30, and Tuesday, November 5, at 3 p.m. each day, when he will discuss fluid therapy. The lectures are open to medical practitioners and advanced students.

Museum Demonstrations

The series of museum demonstrations, announced in this column on October 12 (p. 510), have been cancelled.

ROYAL COLLEGE OF SURGEONS OF EDINBURGH

At a meeting of the Royal College of Surgeons of Edinburgh held on October 15, with Dr. H. M. Traquair, President, in the chair, the following, having passed the requisite examinations, were admitted Fellows:

S. Aptekar, J. J. Commerell, L. G. Cruickshank, G. F. Dommisse, B. W. Goldstone, J. Ll. Griffith, S. P. Gupta, Kathleen M. D. Harding, R. N. Houlding, C. L. O. Macalister, K. C. McKeown, A. I. Macpherson, C. R. Palfreyman, A. R. Parkes, L. H. A. Phillips, J. L. D. Scott, H. O. Smith, W. J. Watt, A. W. Wilkinson, M. O. Youssef.

At the annual meeting of the Royal College of Surgeons of Edinburgh, held on October 16, the following officers were elected for the ensuing year:

President, Dr. H. M. Traquair. *Vice-President*, Mr. W. J. Stuart. *Secretary and Treasurer*, Mr. J. W. Struthers. *Representative on the General Medical Council*, Mr. Alex. Miles. *Convener of Museum Committee*, Mr. W. Quarry Wood. *Librarian*, Dr. Douglas Guthrie.

The Services

ROYAL NAVY

Mentions in Dispatches

The following medical officers have been mentioned in dispatches: Temporary Surgeon Lieut. David William Pugh, D.S.C., R.N.V.R., for coolness and courage in adversity, and Acting Temporary Surgeon Lieut. Timothy Blair MacLean, R.C.N.V.R. (H.M.C.S. *Fraser*), for good services when H.M.C.S. *Fraser* was lost.

CASUALTIES IN THE MEDICAL SERVICES

Royal Army Medical Corps

Prisoners of War

Major George Bromley Matthews, R.A.M.C.
Captain Hugh Dickie, R.A.M.C.
Captain John Robert Odell, R.A.M.C.
Lieut. Denis Westgarth Lacey, R.A.M.C.
Lieut. William Mathieson Macleod, R.A.M.C.
Lieut. Archibald Taylor Smith, R.A.M.C.
Lieut. Ian Osborne Bradford Spencer, R.A.M.C.

Obituary

SIR WILFRED GRENFELL, K.C.M.G., M.D., LL.D., F.R.C.S.

The story of "Grenfell of Labrador" is part of the literature of adventure, and in recording Sir Wilfred Thomason Grenfell's death, which recently took place in Vermont, U.S.A., we can only in a short memoir touch upon the outline of a picturesque career. He was born in Cheshire in 1865, educated at Marlborough, and entered the London Hospital Medical College, qualifying in 1888. For a time he was house-surgeon to Sir Frederick Treves. In the East End of London he came under the influence of the American evangelist D. L. Moody, and "to make his religion real" he accepted arduous missionary work among fishermen in the North Sea. The Royal National Mission to Deep Sea Fishermen, whose service he entered in 1889, commissioned him in 1892 to go out to Labrador to report on the conditions of the fisher-folk working on that lonely coast. He crossed the Atlantic in a small ketch-rigged sailing ship, and on arrival found twenty thousand people, three-fourths of them of the white race, and the others Eskimos and Indians, engaged in the summer fishery. There was not a doctor among them, and in the absence of medical attention small injuries often developed into festering wounds and minor illness into mortal disease. In education and the ministry of religion this region was equally unprovided, save for the labours of some Moravian missionaries, and out of touch with civilization these people laboured on to make a living by fishing, furring, and sealing amid the rigours of the Arctic.

Grenfell set up a health service first of all to combat beriberi and tuberculosis, the two principal scourges. He proved himself to be not only a doctor but an economist, a statesman, and an educator. When the burden of the many activities along which the mission developed became too heavy for the Society which had sponsored it an International Grenfell Association with an endowment of over £200,000 was formed by sympathizers in the United States, and of this the Grenfell Association of Great Britain and Ireland is a supporting body. The organization not only furnished the bulk of the financial support for Grenfell's enterprises, but was the means whereby a great deal of personal service was tendered; hundreds of student volunteers from America came over and devoted their vacation to whatever work was handy—medical students working in the hospitals, others engaged in making waterworks, building docks and wharves, navigating hospital ships, while women served as nurses, teachers, and social workers. Grenfell built on Labrador a chain of hospitals with nursing stations between them, orphanages, child welfare clinics, and public schools, co-operative stores, and a large industrial department giving employment to two thousand people. The staff attached to the mission came to include as many as sixty persons—surgeons, dentists, teachers, and welfare workers—in addition to the large number of volunteers who came over for the summer. One of his most notable enterprises was the erection of a large seamen's institute at St. John's, Newfoundland, opened (by electric signal) by George V on his coronation day. To cover his floating mission field Grenfell used a hospital ship, *Strathcona II*, of which he was not only surgeon in charge but master mariner. He also owned a fleet of yawls in connexion with the various hospitals and welfare centres.

His action in isolating himself from civilization to work for the spiritual help and bodily comfort of the fisher-folk of Labrador caught the imagination of a sympathetic public in Great Britain and America, and although he was never an orator his story of achievement and also of prospect (for he believed in the great resources of Labrador) was listened to eagerly by audiences on both sides of the Atlantic. He was knighted in 1927, and in the following year was elected Lord Rector of St. Andrews in succession to a man of like mould, Fridtjof Nansen. He received the honorary degree of M.D. from Oxford in 1907; he was similarly honoured by Harvard, Toronto, McGill, Princeton, and other universities, and the Royal College of Surgeons of England made him a Fellow in 1920. During the war of 1914–18 he was major in a Harvard surgical unit at Boulogne, but he returned to Labrador in 1916. He was the author of a number of books, of which his autobiography, *Forty Years for Labrador*, published in 1932, is the best known. In 1936, owing to serious heart trouble, he was no longer able to continue active work on the Labrador coast, but the welfare of these simple people remained close to his heart. He married in 1909 an American lady who zealously seconded his efforts, especially for women's welfare in Labrador and Newfoundland. Lady Grenfell died in 1938.

[The photograph reproduced is by Russell, London.]

MAUDE ABBOTT, M.D., LL.D.

Dr. Maude E. Abbott, whose name is known in the medical schools of three continents as an authority on cardiac disease, died in September in Montreal after a three-months illness. She was not only an outstanding figure for her research in congenital heart disease and her pioneer work in the development of a system of classification of medical museums, but she was one of the most brilliant medical students of McGill University, the author of various textbooks on congenital heart disease, and the editor of the Sir William Osler Memorial Volume and of a comprehensive bibliography of Sir William's works.

She was the granddaughter of the late Rev. William Abbott, a former rector of St. Andrews East, and a great-niece of the Rev. J. Abbott, father of the first Canadian-born Prime Minister, Sir J. J. Caldwell Abbott. She was born in 1869, and educated in Montreal. At McGill University she obtained her B.A. degree in 1890, winning the Lord Stanley Gold Medal for general proficiency. In 1894 she took her M.D. degree, later studying in Zurich, Vienna, and Edinburgh. On her return she worked for two years in clinical medicine and pathology at the Royal Victoria Hospital, and was appointed assistant curator of the Medical Museum at McGill University in 1898, becoming curator two years later. In 1905 she became a member of the McGill staff as a research fellow in pathology until 1912, when she became lecturer in pathology. In 1923 she was appointed to the chair of pathology and bacteriology in the Women's Medical College of Pennsylvania, Philadelphia. She was granted two years' leave of absence by the McGill Governors for the purpose of reorganizing these two departments for the correlation of clinical and pathological teaching and the development of medical research.

Dr. Abbott had been appointed lecturer on the history of nursing to the McGill Graduate School in 1920, and in 1923 was appointed Assistant Professor of Medical Research at the University, holding the position until she officially retired in 1936. In 1930 she was elected vice-president of the Federation of Medical Women in Canada, and in 1936 she was awarded a gold medal by the Ontario Medical Association for her exhibit on congenital cardiac disease, which displayed great originality of scientific investigation, and was shown by her in London at the Centenary Meeting of the British Medical Association in 1932. Her brilliance as a teacher and lecturer brought her invitations from many universities, and Dr. Abbott spent two months in 1936 lecturing at the University of California, Stanford University, and the Children's Hospital

of San Francisco, speaking daily and also conducting children's clinics. It was the influence of Sir William Osler that led Dr. Abbott to devote her research work to heart disease.

Many honours were conferred upon her: the honorary degrees of LL.D., M.D., and M.S. of the McGill University, and the F.R.C.P. of Canada. She was made a member of the American Association of Pathology and Bacteriology, the British Pathological Society, a Fellow of the American Association for the Advancement of Science, a member of the Editorial Board of the *Canadian Medical Association Journal*, a Fellow of the Royal Society of Medicine, London, an honorary Fellow of the New York Academy of Medicine, honorary member of the Osler Society, the California Heart Association, and the Cardiac Society of Great Britain and Ireland. Dr. Abbott was the author of many monographs and books on cardiac diseases, including that in Osler's *Modern Medicine* on "Congenital Heart Disease," and also in *Nelson's Loose-leaf Medicine; Atlas of Congenital Heart Disease*, 1936; *History of Medicine in the Province of Quebec*; and a *History of the Medical Faculty of McGill University*.

Those of us who knew her more or less intimately realized something of her beautiful character, for she was generous, vivacious, an excellent colleague, and a wonderful companion. She had the gift of imparting enthusiasm to others and drawing the best out of all those with whom she came into contact. A brilliant lecturer, organizer, and teacher, she was in many ways not unlike her friend and chief Sir William Osler. She leaves behind her a record of a fine life finely lived.

L. M.

JOHN ROWLANDS PRYTHERCH, M.B., Ch.B.,

Member of Council, British Medical Association

We regret to record the death of Dr. J. R. Prytherch, which took place at Llangefni, Anglesey, on October 4 after an illness, in its severe form, of three weeks' duration.

Dr. Prytherch, who was 64 years of age, qualified at Edinburgh University in 1900, and after holding a resident appointment for a short time at Chester General Infirmary, settled down in general practice at Llangefni, where he remained for the rest of his life. He was honorary physician to the Carnarvonshire and Anglesey Infirmary and medical officer to the county isolation hospital. Other appointments which he held were those of medical officer of health to the Llangefni Urban District Council, Post Office medical officer, certifying factory surgeon, and, at one time, medical inspector of school children for the Anglesey County Council. He was also a Justice of the Peace for the island.

Almost from the time of his qualification he was a keen and most useful member of the British Medical Association. For more than a quarter of a century he served as honorary secretary of the North Carnarvonshire and Anglesey Division, and in 1929–31 he was president of the North Wales Branch. He acted as representative of his Division on many occasions from 1911 onwards, and in 1927 he was elected to the Council of the Association, of which he remained a member until his death. His voice was rarely heard in the Council chamber, but his advice was sought on all Association matters affecting Wales, and no member was held in more general esteem by his colleagues. He served on the Welsh Committee of the Association from 1921, with a short break, until his death, and he was a member of the Welsh Contract Practice Subcommittee from 1926 until 1940. Medical service under the National Health Insurance Act interested him from the first, and in this sphere he was very active in his own locality. In 1926 he was chairman of his county Insurance Committee, and he had also been honorary secretary of the Local Medical Committee of Anglesey.

During the war of 1914–18 Dr. Prytherch served as D.A.D.M.S. (Sanitation) at Alexandria. He had the experience of being on a ship which was torpedoed just before reaching port.

Behind his quiet unassuming exterior was real ability and ripe wisdom. He possessed among other qualities a remarkable clinical instinct, and incidentally he had an extensive knowledge of drugs and their actions. He was an extremely likeable man, and his memory will long be green on both sides of the Menai Strait. His eldest son, Dr. R. R. Prytherch, practises at Criccieth.

SIR HENRY HEAD, M.D., F.R.C.P., F.R.S.

Prof. Major Greenwood, F.R.S., writes:

Henry Head's work as a neurologist has been described by those with expert knowledge. Perhaps the memories of an ordinary student may be added. I think what most impressed those of us who were under Head at the beginning of the century was his immense vitality. He was rather *our* idea of the typical (tee-pi-cal!—so enunciated, in a rising falsetto—was a frequent ejaculation) Frenchman. His enthusiasm was contagious; it would have been a very dull clerk whom Head did not stimulate to work. In particular—and this I think was his greatest quality—he convinced those of us who tended to regard "science" as an affair of laboratories rather than wards that we were wrong. He never snubbed young people with ideas, even if the ideas were foolish. He was not much interested in biometry, but he gave me kindly encouragement, and I, like many others, recollect little courteous acts which mean so much—if a very junior demonstrator of physiology is introduced in the drawing room of an eminent physician as "my colleague," it may seem a small thing to remember thirty-two years later, but one *does* remember it. His very foibles were endearing. He had his likes and dislikes. "X," for instance, a student rather older than the average, a shrewd fellow, was not beloved by Head. In O.P.'s a case had been allotted to "X" in which the only physical sign detected was a faint presystolic murmur. "X's" turn came; he carefully detailed the results of his examination until he came to the chest. "There is nothing in the chest, sir." Head's eyes gleamed behind his spectacles; he leaned forward. "Nothing in the chest, Mr. 'X'?" "No, sir, nothing"—Head gathered himself together—"except a presystolic murmur." It was like a Rachel mourning for her children. "Oh, Mr. 'X,' but you said there was nothing in the chest, nothing."

Then Head would criticize the English of our notes—which, God knows, deserved criticism—and ask for the etymology of medical terms. Sometimes what he pronounced not to be English had authority and his etymology none; daring spirits would copy out illustrative quotations or the curt decision of a dictionary to show him. He took it all in good part. He was a great teacher. Perhaps it was chance—after all I am a statistician—but of one batch of clerks for the firm Kidd and Head in, I think, 1901, three became Fellows of the Royal Society each working in a different field.

We regret to announce the death on October 7 in Edinburgh of Dr. James Lochhead, C.B.E., late senior medical officer, Gibraltar. He was born in Scotland at Earlston on February 21, 1877, and from George Watson's College entered Edinburgh University, where he took the B.Sc. degree in 1902, the M.B., Ch.B. with first-class honours in 1904, and the M.D. with gold medal in 1907, obtaining the F.R.C.S.Ed. three years later. During the years after qualification Dr. Lochhead became resident surgeon and later surgical tutor at the Edinburgh Royal Infirmary, resident physician at the Royal Maternity Hospital, and resident surgeon at the Leith Hospital. He then obtained the post of colonial surgeon at Gibraltar, and was honorary secretary of the Gibraltar Branch of the British Medical Association from 1913 to 1929, and thereafter president for seven years. He had joined the Association in 1911, and was a Fellow of the Obstetrical Society of Edinburgh and of the Edinburgh Medico-Chirurgical Society.

The following well-known foreign medical men have died: Dr. William Allen Pusey, a former president of the American Medical Association and of the American Dermatological Association, editor of the *Archives of Dermatology and Syphilology*, and author of *Principles and Practice of Dermatology*, *History of Dermatology*, and *History of Syphilis*, aged 74; and Dr. Harold Douglas, surgeon, editor-in-chief of the *Archives of Neurology and Psychiatry*, aged 65.

Medical Notes in Parliament

The Prolongation of Parliament Bill was presented by Mr. Churchill on October 17, and its second reading was set down for this week. It proposes to extend the life of Parliament by one year from next month.

The Public Health in Wartime

Mr. RHYS DAVIES moved on October 17 a motion declaring that the House of Commons took note of the health of the nation and would welcome an extension of National Health Insurance, particularly to meet the conditions created by the war. This motion was carried unanimously after debate. In his opening speech Mr. Rhys Davies quoted a warning by Lord Horder that unless effective measures were taken the approach of winter might bring a devastating state of affairs in respect of infectious and contagious diseases. He said several million troops in this country were well equipped with medical attention and services, but he was not sure that the civilians were as well placed. As soon as the Germans invaded Holland there was an outbreak of typhoid. A short while ago there had been an outbreak of paratyphoid in the Bolton area. The presence of large contingents of foreign troops—Poles, Czechs, French, Norwegians, and others—mingling with the civil population created a new problem. Information from twenty medical officers of health serving all types of local authorities showed that on the whole the health of the community had not deteriorated and in some cases had improved, although in one industrial county there was a slight tendency to an increase in tuberculosis. That tendency might come from the black-out, because when people blacked out their windows they also closed them. He asked Mr. MacDonald for information on the health of districts like London and Liverpool, where some sewers had been destroyed and water supplies interrupted. He also asked what the Ministry of Health was doing to meet the possible use of poison gas.

The time had arrived when Parliament should extend the medical provision made in particular for the wage-earning classes. There could be no such extensions save through National Health Insurance. About 20,000,000 persons were now insured, with the same number of dependants. Could the Government extend National Health Insurance to cover those dependants, using the panel practice for the purpose? The panel service was the only possible means of covering dependants of insured persons. All over the country voluntary associations of workmen were being established to provide what he asked, with specialist and hospital services in addition, the members paying a deduction on a poundage system from their wages. The British Medical Association had already estimated the cost of extending this system to cover all dependants of insured persons. Mr. Rhys Davies advocated raising the income limit for non-manual workers under National Health Insurance to the £420 a year which now obtained under the Unemployment Insurance Scheme. He thought the attitude of the medical profession was one of the reasons for maintaining the present limit of £250. The British Medical Association had too much influence with the Ministry of Health. He thought that the Ministry of Pensions and not the National Health Insurance scheme should pay compensation to people suffering from nervous collapse as the result of enemy action. He also asked whether the National Health service could be co-ordinated with the surgeon service under the Ministry of Labour and with the doctors employed by some firms to attend to physical welfare of workers in factories.

IMPROVED STATISTICS FOR 1939

Mr. MALCOLM MACDONALD said the Government Departments concerned had closely examined the points raised by Mr. Rhys Davies before the *Blitzkrieg* started, but had since turned to more urgent tasks. They would return to the matter as soon as they could. When war broke out the solidly established health services had produced a cumulative improvement, which even the calamity of war could not disturb, as the health statistics of 1939 proved. Infantile mortality in England and Wales in 1939 was 50 per 1,000 children born, the lowest figure recorded—3 per 1,000 lower than for 1938 and less than half the figure for 1914. Maternal mortality in 1939 was 2.82 per 1,000 births—0.15 lower than in 1938 and little more than two-thirds the figure for 1914. The crude death rate for all forms of tuberculosis in 1939 was 636 per 1,000,000 living—1 per million higher than in 1938 but much less than half the figure for 1914. Only one case of small-pox was notified in 1939. Reports of scarlet fever and diphtheria were fewer than in 1938, and the biennial measles epidemic failed to appear. There was an ominous increase in cerebrospinal fever, which must make them pause in contemplation of the winter which now lay ahead, but the discovery of M & B 693 had reduced the deaths from that disease to almost one-third of what they were accustomed to be. Other drugs in this group of the sulphonamides were healing the wounds of soldiers more swiftly and had proved effective cures for other diseases, notably pneumonia and puerperal fever.

The health services had withstood the strain of the war and the difficult problem caused by the evacuation of 730,000 school children and 420,000 mothers from thickly populated areas, with the necessary medical services, to less populated areas where this provision was sparse. Skilled staff was recruited, equipment distributed, buildings transformed into sick bays, maternity homes, resident nurseries, homes for cripples. For expectant mothers in London there were homes in the country which could cope with 2,800 births monthly; over 500 expectant mothers left London every week. The transfer of children from evacuation areas to the country stimulated their physical well-being. After the war the children must have similar access to the countryside. The inauguration this year of the nation-wide scheme for free milk for nursing mothers and infants was a milestone on the road to national good health.

MEDICAL SERVICES: "A HIGH STANDARD"

The Emergency Hospital Service had joined under one supreme direction the equipment and resources of voluntary and municipal hospitals, and other provision had been made. In the first severe test at the time of the withdrawal from Dunkirk the surgery, doctoring, and nursing proved of a high standard. In the London hospitals sector, which bore the brunt of the work, only 1.7% of the men died from their wounds. In the first twelve months of the war there had been advances in the storage of plasma for blood transfusion, in the healing of serious burns, in the mending of broken jaws, and in plastic surgery generally. He had appointed an adviser on rehabilitation of the wounded, and was forming a committee of medical experts both to develop this treatment for the war and to form the nucleus of an organization which would re-establish the victims of industrial and other accidents in peace. For many weeks civilian victims of air attacks had been tended by stretcher parties, first-aid units, ambulance teams, hospital orderlies, nurses, and doctors, all of whom had performed their tasks with inexpressible coolness and skill. Only 5,500 beds in hospital wards in England and Wales were filled by air-raid casualties, but the House must not feel too much assurance from that fact. Numbers of beds must be reserved for sudden casualties, but they must not keep too many empty.

He had told Mr. Bevin that munition workers who fell ill away from their homes could be nursed in the emergency hospitals. He had also arranged that mothers and children evacuated from London should go for two days into emergency hospitals before they went to their billets. Venereal disease, the camp follower of war, which had steadily declined over the last twenty years, was once more on the increase, partly as the result of the shifting of population to places where there was no established service for its treatment. That service must now be extended. There would be an Exchequer grant of 75% of the cost of treatment facilities required to meet war circumstances. Officers of the Ministry of Health were in touch with local health authorities to help them in effective organization, and in rural areas a van equipped with appliances and drugs and carrying medical, nursing, and clerical staff would periodically visit fixed treatment centres. He would consider, if an application were made, the extension

of this grant to the services of the Social Hygiene Council. The grant would cover facilities for both civil and military cases arising out of the circumstances of the war.

THE SHELTER PROBLEM

The final problem looming out of the winter darkness resulted from the fact that at night the majority of the people of London were not in their houses but in the shelters. Refuges built for short periods of occupation had become dormitories. He and the Minister for Home Security were co-operating on the health aspect of the problem, and had the advice of a committee of experts under Lord Horder, who was an expert on health matters, and who, with his colleagues, had spent much time in studying conditions in London shelters. They had made valuable suggestions, all of which were being acted upon. To ensure provision for health in all the large shelters the Ministry of Health was co-operating with the local authorities and their medical officers of health. He was appointing at the Ministry a body of medical experts who would devote their time to inspections and to see that the standards laid down were maintained. Overcrowding in the shelters was the burden of the problem. By persuasion they were increasing the evacuation from London of people who could be spared. About 56% of the school child population of the London evacuation areas had left. In the L.C.C. area 300,000 out of 500,000 had left. Mothers and children were leaving London at the rate of thousands daily, and every few days some hundreds of the aged and infirm were taken to hospitals and homes in the country. Local medical officers had been asked to visit the shelters, look for the infirm, and invite them to be evacuated. What was an infirm person was left to the discretion of these officers.

To reduce overcrowding the Ministry of Home Security was taking steps to disperse the population to different types of shelter. Bunks would be set up as early as possible to ensure that night dwellers could lie down in comfort. One latrine would be provided for every twenty persons inhabiting the shelter. That standard also applied to underground stations. Latrines were being manufactured as fast as possible. The medical officer of health of each London borough was made responsible for seeing that a frequent inspection was made of each public shelter. In every shelter holding more than 500 people there would be a first-aid post for dealing with minor ailments and a sick bay in case partial isolation of individuals sleeping in the shelter became desirable. Inhabitants of the shelters who contracted infectious diseases or other serious illnesses would be taken from the shelter and accommodated in hospital. The Ministry was examining the ventilation in the shelters and the possibility of using some spray for disinfection. They were in consultation with the Medical Research Council on some of these points.

CLASS PATRONAGE IN E.M.S.

Dr. MORGAN said Mr. MacDonald's programme for the tube shelters had not been carried out. The Post Office tubes should be used as centres for a medical staff to be constantly on duty. The Ministry had neglected the municipal hospitals in making appointments of medical officers to the Emergency Medical Service. The sector officers had been selected, on class patronage, from the voluntary hospitals with no proper investigation of their qualifications for administration. Lord Horder was not a public health authority. Turning to national health insurance, Dr. Morgan said the vested interests in the approved societies hid their mistakes by constantly attacking the doctors, although these general practitioners were the front-line pioneers of the medical profession. A House of Commons Committee should review the work of the Ministry of Health. He asked whether Mr. MacDonald's future policy would bolster up the voluntary hospitals, which were out of date. Would he consider a national health system whereby every citizen was entitled to the best medical attention? He condemned the clearing of beds in tuberculosis sanatoria to make room for casualties. He knew instances of this being done in Wales, where tuberculosis was rampant. The Ministry should ask local authorities to keep the sanatoria beds fully occupied with tuberculosis cases. More fracture clinics were required. He believed there were only two in Wales. In one hospital, owing to the attitude of the Treasury, a physiotherapy centre had not been set up although it was asked for more than a year ago. Mr. MACDONALD replied that the policy of his Department was that these centres should be set up in all hospitals.

Dr. HADEN GUEST supported the plea for the provision of medical services to the dependants of insured people, but said that at present it would be inopportune to go in for fundamental reconstruction of the medical administrative machinery. The extension of all forms of medical treatment freely to all people would do a great deal to prevent the spread of epidemics in the conditions set up by war. The Minister might consider the pooling of all the hospitals on the lines of the Emergency Medical Service, and the simplification of the machinery of administration. Dr. EDITH SUMMERSKILL said conditions in underground stations within a mile of the Ministry of Health would make members of a primitive tribe blush. Epidemics were now beginning. The measles epidemic was gaining ground, and pneumonia would follow. Almost before the measles rash had disappeared the mother would take the infected child to the shelter. A number of her own patients had "shelter legs"—swollen legs through not resting. Let doctors go to underground shelters and give simple lectures on simple complaints. Mr. MacDonald should provide free medical treatment. The doctors were ready for it because in seven weeks a revolution had taken place in the profession. Doctors in the East End found that vast panel practices had vanished, the wealthy patients of Harley Street were now obtaining advice from provincial consultants, and West End doctors had to obtain State support from the Emergency Medical Service.

GOVERNMENT REPLY

Replying to the debate, Miss HORSBRUGH said it was not possible at present to have a thorough overhaul of the social and insurance services of the country. Evacuation had brought children and other persons under a medical health scheme as never before. She reminded Dr. Morgan that the Deputy Director-General of the Emergency Hospital Service came from a municipal hospital. She informed Sir Francis Fremantle that the death rate for 1939 was 12.1, which included civilian casualties but not Army casualties. They had tried health lectures in shelters, but they had been a failure. Plans had been made at the Ministry of Health and experts consulted on the danger of epidemics and the spread of minor diseases, and the provision of doctors and nurses at posts.

Medicines and the Purchase Tax

During the discussion of the Purchase Tax Commencement Order on October 15 Sir KINGSLEY WOOD said a list of drugs to be exempted had been published. That list was prepared by eminent medical men who were good enough to assist Mr. MacDonald. Representations about this list had been received and were being urgently considered by the Departments and by the medical advisers. After that consideration a list, amended if necessary in view of the representations received, would be prepared, and, as provided by the Act, would be laid before Parliament.

As previously stated, the House approved the bringing of the tax into operation on October 21.

Physical Training for Youth

Mr. RAMSBOTHAM elaborated, on October 16, the statement he had made to the House in August [*Journal*, August 31, p. 305] on physical training for adolescents. He said the extension of this was made more difficult by the disturbances of the past month and by the approach of winter. During the past twelve months the local educational authorities and the Board of Education had done much to maintain and improve the mental, physical, and social development of boys and girls between the ages of 15 and 20. In the Service of Youth movement more clubs had been started. The local authorities had expanded existing centres and had formed new ones. Up to the age of 14 almost every boy and girl got a regular daily period of physical education on scientific lines. But at 14 children's bodies were as immature as their minds; they needed much care and culture between that age and 18. That part

of the Fisher Act which involved the release of boys and girls from their work for physical education was a practical proposition, but could not be carried out at once. Physical training organizers and teachers had been called up for the Army. Halls which would be required in winter were in demand by other Departments. Meanwhile he would help the local education authorities and the voluntary organizations to extend and improve the physical education which they already provided. He would also seek the co-operation of industry. He had announced in August the setting up of a small body to give a central and direct impetus to the movement. He had asked the local education authorities for particulars of the physical education they provided and for the numbers attending. He had arranged with the War Office for the release of physical training organizers and teachers, and with the Ministry of Labour to defer the calling up of others. The War Office was co-operating with the Board of Education in releasing or avoiding the requisitioning of premises suitable for physical training. The War Office had appointed a representative to the Central Directorate of the scheme. The Directorate would see that the medical side of physical recreation was safeguarded. The National Youth Committee had the assistance of Lord Dawson of Penn, with whom Mr. Ramsbotham said he would keep in touch. He did not contemplate the appointment of a Commissioner of Youth. He believed a large number of young people would respond to the scheme, and he was investigating the possibility of instituting a badge.

Sir FRANCIS FREMANTLE remarked that Mr. Ramsbotham had said nothing on the institution of a National College of Physical Training. He recalled that in January, 1935, the British Medical Association appointed a committee on physical culture, to bring together the medical profession and technical experience. That committee's final report laid down that body, soul, and mind should reinforce each other. The fitness campaign had been disappointing in the past three years because it had been too much one of gymnastics, athletics, and physical well-being. The medical profession was essential to the scheme. There must be not merely compulsion but medical supervision to exclude or restrict the unfit, to avoid overstrain, and to advise the inexperienced. He hoped the Government's Scientific Advisory Committee would be consulted on this. There must be a medical supervisor at the head and medical men and women as local or regional supervisors, with the co-operation of medical institutions.

Mr. NOEL BAKER said that of 3,000,000 boys and girls between 14 and 18 little more than 1,000,000 had opportunity for physical training or exercise of any kind. He believed the Government would get good results out of the present proposals.

Replying to further debate, Mr. CHUTER EDE said there was no militarist scheme at the back of the proposals by the Board of Education. Soon after peace was secured the Government would go on with the scheme for the National College of Physical Training. The site secured for that College was still available.

Rehabilitation of Air-raid Casualties

Asked by Mr. ELLIS SMITH about the rehabilitation of civilians who received injuries through the war, Mr. MACDONALD answered on October 17 that under the Emergency Hospital Scheme special centres, including remedial therapy departments and workshops, had been established for the treatment of orthopaedic and other types of injury which required rehabilitation. He had these arrangements under review at the present moment and had appointed to assist him as adviser in rehabilitation Mr. Rhaiadr Jones, manager of the Derwen Cripples Training College, Oswestry. An interdepartmental committee on vocational training had been appointed by the Minister of Labour.

Attendance of Doctors at First-aid Posts

Sir WILLIAM JENKINS asserted that it had been not unusual for doctors attached to first-aid posts to report at those posts even on a preliminary warning of an air raid, as well as on occasions when a public warning had been given which did not result in bombing or casualties. As each such attendance involved the State in a payment of 1½ guineas in addition to a retaining fee of £70 in an A area and 21 guineas in other areas, he asked Mr. MacDonald the cost involved in the first six months of the year 1940; and whether he would consider some reduction in this cost. Mr. MACDONALD replied on October 17 that he was not aware that doctors had usually reported at first-aid posts as stated by Sir William. In two circulars local authorities had been informed of the procedure to be followed in the matter. Doctors should not receive payments in addition to any retaining fees, except for attendance at first-aid posts when summoned from the Control Centre, and at mobile units whenever a public warning was sounded. The position in regard to mobile units was under reconsideration. The figure of cost involved in the chargeable attendances was not available as a separate item. The circulars he had mentioned aimed at economy of cost as well as avoiding unnecessary demands on medical personnel.

Hospital Evacuation from Vulnerable Areas

Replying to Mr. Sorensen on October 22, Miss HORSBRUGH said arrangements had been in operation since the beginning of the war by which a large part of the ordinary work of the London hospitals had been carried on in the outer hospitals. At the present time the majority of the acute sick were being treated in outer hospitals. Some hospital beds must be maintained in London in order to deal with casualties and urgent sickness or accidents. Mr. MacDonald did not at present consider it necessary that comparable arrangements should be made for any other area, although he was watching the position. Hospital accommodation outside the main towns was limited, and the beds must be kept clear in the outer hospitals for casualties and Service sick.

Health Conditions in Shelters.—Mr. MacDonald is arranging, in collaboration with the Minister of Home Security and the local authorities, for a system of medical inspection, central and local, of public health conditions in shelters, which will include reports by the officers concerned. He stated on October 17 that there were then no indications of maladies ascribable to the shelters.

Rise in Tuberculosis Death Rate in Scotland.—Mr. ERNEST BROWN has issued the following table of deaths in Scotland from tuberculosis: 1938, 3rd quarter, 766; 4th quarter, 769. 1939, 1st quarter, 995; 2nd quarter, 943; 3rd quarter, 782; 4th quarter, 806. 1940, 1st quarter, 1,180; 2nd quarter, 1,069. He adds that it is too early yet to say whether the recent rise in the tuberculosis death rate has been due to the exceptionally trying weather conditions last winter in Scotland, which bore with particular severity on persons suffering from chest weaknesses.

Artificial Limbs after Amputation.—Mr. ELLIS SMITH asked Sir Walter Womersley on October 16 why men had been discharged after amputation without being supplied with artificial limbs. Sir WALTER said he was medically advised that a short interval should elapse between the healing of a stump and the fitting of an artificial limb. No good purpose was served by keeping the man in hospital during this time, and he was accordingly discharged to his home and given a provisional pension at the 100% rate. As soon as the stump had settled down he was fitted with a limb at one of the Ministry's limb-fitting centres.

First Aid for Rest Centres.—Officers in charge of rest centres have been instructed to make themselves aware of the address of the nearest first-aid post. In London there is a nurse available at short notice for any centre for which she may be required during the day. At night a nurse is regularly in attendance in the majority of the centres. Instructions are being issued that similar arrangements should be made throughout the country.

Notes in Brief

Provision for the immunization of members of the Home Guard against tetanus, as in the Army, is under consideration.

Steps are being taken to provide medical care during the winter for interned aliens of enemy nationality in the Isle of Man.

During the past twenty years about 2,000 cases of total blindness have been accepted as due to war service, and about 9,000 cases of loss of one eye.

The Personal Injuries (Emergency Provisions) Act, 1939, covers cases of shock associated with physical injury, including concussion, resulting directly from war operations.

Medical News

The *London Gazette* prints a list of names brought to notice for gallantry or good service in connexion with Civil Defence. Among them is that of Dr. Elsie A. Burns, principal medical officer, Fazakerley Group of Infectious Hospitals, Liverpool.

The fourth Pan-American Congress of the Red Cross will be held at Santiago, Chile, from December 5 to 14, under the direction of General L. Brieba, president of the Central Committee of the Red Cross in Chile.

According to the *Pharmaceutical Journal*, refugees from the Channel Islands report that under Nazi control a few pharmacies are carrying on, but before any medicine can be bought a doctor's certificate must be produced, and even then supplies may not be available. No deliveries are being made by shopkeepers.

The London Council of Social Service, in a report on emergency work during the twelve months ending with March, says that its major task was the establishment and administration in the London area of the Citizens Advice Bureau service. The council had the co-operation of the Charity Organization Society, which undertook responsibility for setting up bureaux in the twenty-four metropolitan boroughs and in Hendon. At the close of the period there were 157 bureaux in seventy-nine of the eighty-eight local authority areas included in the council's field of operations, and they had dealt with over 115,000 cases.

Dr. Harvey Pirie, President of the South African Medical Association, has been appointed chairman of a central emergency committee working in the interests of the health of the South African Forces.

EPIDEMIOLOGICAL NOTES

Infectious Diseases for the Week

For the last two or three weeks detailed figures of notifications of the acute infectious diseases in the different districts of the administrative public health areas have not been to hand at the time when the figures for the whole of England and Wales were available. The time-lag is unavoidable, and occasionally it may be necessary to hold over the publication of the table. This week the figures for column (*a*) and for deaths in column (*b*), 1940, were not available at the time of going to press.

Diphtheria, scarlet fever, measles, whooping-cough, and pneumonia have been increasing in prevalence lately; there is a fall in the incidence of enteric fever, cerebrospinal fever, and acute poliomyelitis.

In Scotland increased notifications were recorded during the week for enteric fever, cerebrospinal fever, acute poliomyelitis, whooping-cough, and pneumonia; the notifications of measles and scarlet fever have fallen; the figure for diphtheria remained at 370 for the week. Diphtheria has replaced measles as the most prevalent disease, involving seventeen of the thirty-one counties and twenty of the twenty-four burghs—notably Lanark 35, Midlothian 8, Dumbarton, Selkirk, and West Lothian 6 each, and the burghs of Glasgow 133, Dundee 44, Edinburgh 23, Aberdeen and Paisley 13 each, Perth and Port Glasgow 5 each. There were 7 deaths from diphtheria in Glasgow and 1 in Edinburgh. Measles has been reported chiefly from burghs—Greenock 61, Glasgow 59, Aberdeen 49, Port Glasgow 47, Dundee 26, Paisley 25, and Kirkcaldy 14. The single case of typhoid fever (1 death) occurred in Glasgow, and the 10 cases notified of paratyphoid B fever were in Roxburgh C. 4, Edinburgh 2, and 1 each in the counties of Ayr, Berwick, Midlothian, and Aberdeen. Acute poliomyelitis was confined to three burghs: Paisley 4, Edinburgh 2, Kilmarnock 1. Cerebrospinal fever rose during the week from 33 to 35 cases and involved sixteen counties and burghs—chiefly the counties of Ayr, Lanark, Ross and Cromarty 2 each, and the burghs of Glasgow 8, Edinburgh 6, Dundee 5.

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INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended September 28, 1940.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1940					1939 (Corresponding Week)				
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)
Cerebrospinal fever		11	35	—	4	19	2	10	2	—
Deaths			4				—	2		
Diphtheria		53	370	33	25	904	33	170	34	27
Deaths			8	—	—	16	—	3	—	1
Dysentery		1	64	1	—	23	3	27	—	—
Deaths			1	—	1			—	—	—
Encephalitis lethargica, acute		—	—	—	—	4	1	1	—	—
Deaths			3				—	2		
Enteric (typhoid and paratyphoid) fever		—	11	1	—	68	3	6	3	4
Deaths			1	—	—	2	—	1	—	—
Erysipelas		34	59	8	5			62	5	3
Deaths			—				—	1		
Infective enteritis or diarrhoea under 2 years										
Deaths			12	11	11	55	8	17	11	5
Measles*		190	303		8			6		8
Deaths			—	—	—	1	—	—	—	—
Ophthalmia neonatorum		5	33		3	66	4	15		—
Deaths										
Pneumonia, influenzal†		42	8	—	4	312	12	5	—	6
Deaths (from influenza)			—	—	—	17	—	2	—	1
Pneumonia, primary			148	8				105	7	
Deaths‡				4	4		4		7	7
Polio-encephalitis, acute		—				4	—			
Deaths							—			
Poliomyelitis, acute		1	7	1	—	43	—	—	—	—
Deaths			—				—	—		
Puerperal fever		4	8	3	—	—	—	9	2	—
Deaths							—			
Puerperal pyrexia		8	18		—	162	8	24		1
Deaths										
Relapsing fever					—	—	—			—
Deaths										
Scarlet fever		82	196	42	45	1,163	37	193	50	79
Deaths			—	—	—	2	—	—	—	—
Small-pox		—	—		—	—	—	—		—
Deaths			—	—	—		—	—	—	—
Typhus fever			—	—	—	—	—	—	—	—
Deaths			—	—	—			—	—	—
Whooping-cough*		8	87		17			39		5
Deaths			2	1	—	9	2	—	—	—
Deaths (0-1 year)			56	22	23	308	30	55	31	13
Infant mortality rate (per 1,000 live births)										
Deaths (excluding still-births)			558	187	128	4,078	629	600	157	129
Annual death rate (per 1,000 persons living)			11.3	12.5	11.2			12.1	10.6	11.3
Live births			868	364	235	6,263	877	850	384	208
Annual rate per 1,000 persons living			17.6	24.3	20.6			17.2	25.8	18.3
Stillbirths			37			235	28	35		
Rate per 1,000 total births (including stillborn)			41					40		

* Made notifiable generally on November 1, 1939.

† Includes primary form in figures for England and Wales, London (administrative county), and Northern Ireland.

‡ Since January 1, 1940, figures for London (b) have been for all forms of pneumonia; the corresponding figures for 1939 relate to deaths from lobar pneumonia only.

Letters, Notes, and Answers

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QUERIES AND ANSWERS

Income Tax

Partner on Military Service

"SURGICAL PARTNER" writes—we are a firm of three partners, one of whom has been on active service since February, 1940. The firm's assessment for 1940–1 is based on the earnings of all three partners for the year to March 31, 1940, plus the pay, etc., of the partner on active service. Actually a locumtenent has been employed owing to one partner's absence and the practice earnings will suffer accordingly.

*** It is assumed that the absent partner's military pay has been assessed separately by the War Office and not included in the firm's Schedule D assessment. The only escape from the previous year's basis for the practice profits open to the partners is the special provision applicable to 1939–40 onwards, by which an individual whose earnings as assessed exceed by more than 20% the amount of the earnings for the actual year. Whether or not the partners will be able to prove that they come within this condition for 1940–1, and are therefore entitled to have the assessment reduced to the earnings for 1940–1, cannot, of course, be ascertained until March 31, 1941. That, however, will be in time to obtain an adjustment of the instalment of tax payable in July, 1941.

Temporary Cessation of Practice

"MAJOR" was, up to mobilization with the Territorial Army on August 24, 1939, engaged partly in practice as a consulting physician and partly in a university appointment. Since mobilization "the practice has, of course, come to an end." The inspector of taxes objects to the allowance of expenses, professional subscriptions, rent of rooms held for resumption of practice work, and so on.

*** The objection seems technically correct, though it involves some hardship. If "Major" were in a position to do professional work and were, so to speak, holding himself out to do it, but in fact no work was offered, he could claim to deduct the expenses and treat the resulting loss as a set-off from his other income. As it is, however, he cannot properly allege that he is carrying on his consulting practice, and consequently no deduction can be claimed.

Temporary Residence in the United Kingdom

"H. L.'s" inquiries will be sufficiently clear from the following replies.

*** A Canadian coming to England for two or three years is liable, as a temporary resident, to income tax here as from the date of his arrival. The basis of liability as regards income from foreign investments, etc., is as follows: first year, the amount received in the year of assessment; second year, ditto; third year, the amount received in the previous year. If there is some doubt as to the amounts which will be received in either of the first two years part of the tax payable is usually kept in abeyance until the end of the financial year concerned; in this way any adjustment for an incorrect estimate is avoided. Although the basis of assessment for the third year is the amount received in the second year, that assessment can on the taxpayer's application be reduced to the amount received in the third year. As the disability pensions presumably arise under contract we do not think that, so far as income tax is concerned, any valid distinction can be drawn between one arising from a mutual as compared with a non-mutual concern. Assuming that "H. L." is not entitled to any allowances other than the £100 personal allowance, the tax payable on £526 for 1939–40 would be £117 12s., and on £300 for 1940–1 £56 2s. 6d. In the event of death the period from the previous April 5 to the date of death is treated as a year for calculating the tax due on the current year's basis, which then applies.

LETTERS, NOTES, ETC.

Examination of the Heart in Recruits

Dr. G. ARBOUR STEPHENS (Swansea) writes: Dr. Geoffrey Bourne in his article dealing with the examination of the heart in recruits (October 5, p. 442) makes the statement regarding "an associated nervous increase in the blood pressure" that it is "presumably due chiefly to increased output." A statement of this sort can hardly be described as scientific, can it? Then he also tells us that if a systolic murmur is absent in the erect position it is unlikely to be organic. Unfortunately he does not give us the odds he is prepared to lay. Furthermore, it would be of great help had he told us to what a murmur—organic or functional—is due. I would suggest that before we can speak authoritatively about murmurs we should be in a position to give the cause of the normal heart sounds. Dr. Bourne gives us estimations of the blood pressure in four of his cases—namely, 150/60, 126/72, 138/70, and 152/80. The first patient was unfit because, he says, 60 is too low, yet the others varying 20 points upwards were passed fit. It would be interesting to know within what limits the normality of the diastolic pressure varies. When the systolic and diastolic pressures are estimated it is highly desirable for us to know something of the normality of their ratio. In these four cases the ratios are 2.5, 1.75, 1.97, 1.9, showing a very marked percentage variation even in the cases said to be normal. As the pressure varies with the width of the armlet these figures need further elucidation before any use can be made of them.

Teaching of First Aid

Dr. N. S. B. VINTER (Corps Surgeon, St. J.A.B., Bristol) writes: All medical men will agree that a sound knowledge of first aid is necessary for the personnel of the A.R.P. casualty services, but there is a risk of disagreement about what standard of knowledge and skill should be expected. For myself I would answer the question by saying—the highest standard of first aid attainable by regular practice and instruction. For members of the casualty services the first-aid certificate should be regarded as a starting-point, just as with us qualification is the beginning of a professional career. In an area where there is little actual duty the first-aiders should assemble for practice in first aid at least once a week, as well as for their training as a branch of the Civil Defence Services. With a weekly practice a high standard is reached in the uniformed organizations after a couple of years. I say a couple of years because in my experience the first re-examination is usually the poorest. I would strongly advise any lecturer who has not already done so to attend these weekly practices himself. He will in this way become more familiar with the methods, and will find out the difficulties of his class through the numerous questions he will be asked. An annual re-examination is required by the uniformed organizations, and I don't think the casualty service can let its standard be lower than theirs. Unfortunately the Government (or is it only our own county council?) has not thought fit to finance re-examinations; but I found that the members of my own mobile first-aid post were quite willing to pay the examiner's fee, and often an examiner can be found who is willing to return his fee in cases of real hardship. The St. John Ambulance Brigade does not insist on a course of lectures before re-examination, and with regular practices and instruction from the medical officer such a course is not necessary in most cases. But I find that the members have no objection to a course of lectures, and attend well when it is being given. The lecturer is not so tied down in giving a revision course as in the first one. He need not spend time on elementary definitions, but can go into fuller detail of the methods employed, and the reasons for them. It is, however, essential to remember that first aid is a practical craft or it is nothing.

The Grenfell Association

No one will doubt that the beneficent work for the people of Labrador and Newfoundland to which Sir Wilfred Grenfell devoted his life will be continued by the Grenfell Association of Great Britain and Ireland, but to do this the association will need even more help from the public than it has received in the past. In sending us specimens of the Labrador Christmas cards, which are being sold again this year, the association states that it is especially anxious to help the children of Labrador and Newfoundland when so many of their fathers are now with the Services. The cards, of which there are seven designs, varying in price from 1s. 6d. to 2s. 3d. for a box of six, postage extra, may be obtained from the secretary, Grenfell Office, 66, Victoria Street, S.W.1.